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CONTENTS

EDITORIAL:

Editorial Notes 1029
Rails Broken by Flat Wheels 1031
The Railway Labor Situation. VI 1032
Denver, Northwestern & Pacific 1033
New Books 1034

LETTERS TO THE EDITOR 1035

ILLUSTRATED:

The Florida East Coast Extension; by Frank M. Patterson 1036
Defective Box Cars and Damaged Freight 1050
C. R. Gray to be President of the Great Northern 1058

MISCELLANEOUS:

Block Signal Mileage, January 1 1043
Government Railway Operation in France; by Paul Leroy-Beaulieu. 1047
Increased Inspection at Rail Mills 1057
Foreign Railway Notes 1035, 1047, 1049, 1057

GENERAL NEWS SECTION 1059

THE widespread expressions of appreciation and approval which the series of articles on Defective Box Cars and Damaged Freight has evoked from railway officers, emphasizes the importance of immediate action being taken to improve the condition of the equipment. The railways cannot delay very much longer in placing orders for large numbers of freight cars, and now is the time to decide on the designs and details which must be used in order that this equipment may not prove a burden, because of its inefficiency in protecting the freight which it must transport and because of the high maintenance costs which follow the tendency to cut down the weight and price of the cars below a reasonable limit. The practical men, in both the operating and the car departments, who come into close contact with the cars and who have exceptional opportunities of seeing their weak points, should be consulted in deciding on the details. In order that all of the roads may co-operate and work together in this improvement for better equipment, the American Railway Association should take forcible measures to insure prompt and general action being taken, as recommended in the conclusions of the last article in the defective box car series, which appears elsewhere in this issue. A bureau to pass upon the new equipment and the improvement of the old equipment to make it satisfactory from a transportation standpoint is just as necessary, and possibly more so, than the Bureau of Explosives, or the Committee on the Relations Between Railroads.

THE aim of the car designer and of the men who direct the purchase of freight cars has been along the lines of securing cars of light weight, to make the ratio of the dead weight of the car to the capacity as low as possible and also to reduce the first cost to a minimum. The condition of the box cars on many lines would seem to indicate that this tendency had been carried much too far and that the possibility of heavy maintenance costs and of damage to freight due to defective design and construction had been almost entirely overlooked. In the study which we have made of defective cars and the resulting loss and damage to freight we have found that one wooden box car was so much better than the average that it has strongly attracted the attention of the operating and mechanical department officers who are engaged in the problem of developing a model box car from the standpoint of reducing the amount of loss and damage to freight. This is the 40-ton box car on the Atchison, Topeka & Santa Fe. The car was designed under the direction of E. Posson, engineer of car construction, and is probably more nearly water proof, grain tight and burglar proof than any other type of all-wood box car in general use in this country at the present time. Some of the methods Mr. Posson follows in developing a design are worthy of thoughtful consideration by men engaged in this work on other roads. The Santa Fe is a large system, but every morning he has on his desk and studies over a report of all of the bad order cars on the system for the previous day. In this way he is able to follow up the cars in service and get some idea of their reliability. In designing the box cars special attention is given to making them burglar, water and cinder proof and grain tight. After the cars are designed, and the contracts are let, the builders are first required to build a sample car. This is not only closely inspected during the process of building by inspectors from Mr. Posson's office, but he himself spends a couple of days in making a critical and accurate examination of every portion of the car. When the sample car is finally passed upon, all the cars in the order must conform strictly to it.

GOVERNOR FOSS, of Massachusetts, has vetoed the full-crew bill passed by the legislature of that state, holding it to be inequitable, because it does not provide for adjusting the number of men in a crew to different kinds or classes of trains. The bill had received only two negative votes in the House, and only one in the Senate. The appeal which the railways made in the newspapers calling upon citizens to oppose this bill, appears to have fallen on very deaf ears, especially in the legislature. However, it is to be said for the upper House that on a motion to pass the bill over the governor's veto fourteen senators voted against it; and the motion failed, the law calling for a two-thirds majority. This would have required 24 votes instead of the 20 which it received. The governor has done a good thing; but his motives seem to be largely political. In his veto the governor says that the state ought to have a public service commission; meaning, presumably, that he thinks the present railway commission has insufficient power to deal with questions of this kind. In

demanding a "public service" commission the governor seems to be dazzled by the mere name, which has become so popular in other states. The principal projects which he has in mind appear to be all connected with transportation, the scheme for consolidating the New Haven and the Boston & Maine with a tunnel across Boston and electrification *ad libitum* being the largest one. But, for transportation matters, the state already has a radical law, passed only last July. The act then adopted (Chapter 755) gives the railway commissioners power not only to change rates, with as much freedom as was ever enjoyed in Georgia, Oklahoma, or any other radical community, but also to correct improper or inadequate practices, equipment, appliances and service; all these powers to be subject to no restraint except that of the courts; which restraint exists, of course, in all the states. Apparently the reason that Massachusetts has not entered upon a course of radical railway regulation is that a majority of her commission is composed of conservative men. It is true, however, that Governor Foss has not shown himself to be quite so conservative.

THE means being adopted for increased inspection of rails during the processes of manufacture, which are described elsewhere in this issue, will be very advantageous in several ways, both directly and indirectly. In the first place, under this new arrangement the inspector who finally accepts a rail will have a knowledge of the history of its manufacture when he inspects it, and if what is recognized and provided for as good practice in the particular mill has been departed from in any stage he will be prepared to subject the rail to a severer scrutiny. In this way he should be able to detect many such rails as now go into the track defective because of bad mill practice and which later fail in service. An important indirect benefit will be the moral influence of having the inspectors in the mills at all times. Although the inspector has no authority over the workmen, the latter will be less disposed to deviate from the established rules, or good practice, or from the specifications when they know that this deviation will be made a matter of permanent record and that their personal identity will be connected with any defective rails produced, and the foremen in charge will also have the same personal reason for exercising care. Under the existing practice of paying the men on the basis of the tonnage turned out, the inclination is great to rush the work, especially immediately after any delay. Suppose that either the blooming or the rail mill is forced to suspend operations for a short time. The steel converters or furnaces continue turning out steel and the soaking pits become congested. When the repaired mill starts again the tendency is to hurry the ingots through the soaking pits and the blooming mill in order to catch up with the steel plant. The time the steel should stay in the soaking pits may thereby be reduced, giving rise to cracks in the metal which will not weld in rolling and which pass into the finished rail. With an inspector looking on, and knowing that such action will be reported, the foreman will be less likely to permit the material to be rushed in this way, and the men less inclined to attempt it; and even if the work is unduly hurried the final inspector will be warned to watch the rails from this heat closely. In this way a stricter adherence to good mill practice should be secured and the quality of the rails should be improved, benefiting not only the railway, but also the maker, by reducing the percentage of second quality as well as of defective rails. Another important advantage will be the securing of a greater knowledge of the rails put into track. From the records of each heat furnished to the railways their engineers will be able to study the relations of mill practice to service results. Heretofore the railways have been at a great disadvantage in studying rail failures because of their inability to go back of the finished rail—to look "behind the returns." It is very probable that a study of service records in the light of the records of manufacture of the very steel whose results are studied will show where improvements can be made to insure a sounder rail. Another thing to be considered in reference to this increased inspection is the attitude of the state and federal commissions. When the manufacturers and railways co-operate properly in adopting all practicable measures to insure the making of sound rails there can be no good ground, or even plausible pretext, for interference by the public authorities, and the traveling public will feel much greater confidence in the safety of transportation.

A BANKING house has been extensively advertising in the newspapers that two men prominently identified with the railway business whose names are given—one the vice-president and general manager of an important railway, the other a "railway capitalist," and so advertised—are directors in a railway supply company which has been organized to take over several smaller concerns, and that "The organization includes executives and engineers of recognized prominence among railway officials throughout the United States." It is further stated that "the constituent companies manufacture and install complete systems of special electrical equipment now in use on practically all the railways in the United States, including"—here follows a list of twenty-two of the largest trunk lines in the country. Further along the statement is made in blackface type: "The scope of the company's business, the established reputation of its products, the character of its customers, and the personnel of its management, indicate the importance of this corporation in the railway field." In conclusion, the public is invited to buy stock in the company. It is hard to believe that any man connected with the railway business can have read this advertisement without feeling that while it might be the sort of publicity which would induce people to buy the stock offered for sale, it was bound to injure the reputation of the two railway men mentioned as directors, and those of railway men in general. The statement that the organization "includes executives and engineers of recognized prominence and acknowledged reputation among the railway officials throughout the United States" is certain to convey the impression, whether intentionally or not, that prominent railway men throughout the country are identified with this supply company; and even merely advertising that two railway men were directors would be enough to cause many persons to jump to the conclusion that numerous other railway men are similarly identified with this and other like concerns. Furthermore, what interpretation will naturally be put on the statement that *"the character of its customers"* and *"the personnel of its management" "indicate the importance of this corporation in the railway field"?* (The italics are ours.) If the advertisement had been deliberately so worded as to furnish ammunition to those who make it their business to attack railway management it could not have been more cunningly adapted to that purpose. We understand that one of the railway men who are directors was elected to serve only temporarily; but the harm caused by the use of his name in this connection is now done. Does not the fact, that the giving of publicity to the connection of railway officers with railway supply concerns causes comment and develops a public opinion that injures railway men and the roads, in itself furnish pretty strong evidence that such connections are most undesirable from the standpoint both of the railway men and the roads, and is it not true that conditions that thus invite criticism are conditions which, as a matter of railway policy, not to mention any stronger reason, ought not to exist? Railway officers complain loudly about the attacks of the muck-rakers, about a hostile public opinion and about restrictive and harmful public regulation; but it is unfortunately true that hardly a day passes when things are not done by railway men themselves which furnish ammunition to the muck-rakers, incense public opinion and furnish the pretext for the very kind of regulation of which they complain. Fortunately, on the other hand, the number of railway officers of whom this must be said is growing smaller.

RAILS BROKEN BY FLAT WHEELS.

IN the various articles relating to the rail situation recently published in the *Railway Age Gazette,* rail breakage due to inherent defects of the steel have been discussed. The relation of the rail section and wheel loads has been considered, but the effect of flat wheels running at high velocity has hardly been touched on. During January and February, when the weather was most severe, several lines reported derailments due to broken steel tired wheels and numerous broken rails were caused by the blows from flat spots on steel tires on passenger car wheels, tender wheels and locomotive drivers. Prominent among these were wheels on the very fast limited trains on the eastern lines, and on some of these the wheels were not only slid flat but broken, and the condition became so serious that investigations were made to ascertain the cause. It was naturally attributed to the brakes and brake shoes, and, while these are held blameless under normal conditions, it is a fact that the heavy brake pressure required for the safe running of very fast trains heats the wheels and applies loads which sometimes set up stresses beyond the limits of their resistance. With proper manipulation of the brakes and favorable rail conditions these brake pressures exceeding the weight on the wheels may be used successfully; but with a slippery rail and irregular brake action the wheels may be slid flat, and if not promptly removed will break the rails when running at high speed.

As we have previously contended in these columns, some factor of safety must be allowed in the strength and section of the rail for high stresses set up in this way, but there is a limit to the size of the flat spot and to the speed, beyond which it becomes dangerous to the best of rails. The speeds of freight trains are so slow that a length of flat spot on cast iron wheels of 2½ in. has become a well established standard and few broken rails have ever been traced to that combination. The effect of speed on the damage to rails by slid flat wheels is properly recognized by limiting the length of flat spots on steel tired wheels in passenger service to one inch. The difficulty is that the spot may increase in size considerably above one inch on a single run, and the damage to rails is accomplished before there is opportunity to remove the wheel. In 1909 the question of reducing the limit for freight wheels to less than 2½ in. was considered by committees of the Master Car Builders' Association and the American Railway Engineering Association, but it was not then considered advisable to make any change in the rule.

In the *Railway Age Gazette* of March 16, 1910, we reported 200 85-lb. rails broken in 14 miles by a flat spot which had grown to a length of 6 in. and maximum depth of ⅜ in. The following are representative of conditions on many lines during the severe cold weather of January and February, 1912. During January of this year a case was reported on a line in Minnesota where a small flat spot on a rolled steel wheel in passenger service enlarged to 4 in. long and broke nine 80-lb. rails in a distance of 3 miles. On January 7, a flat spot 5½ in. long on a steel tired wheel on a passenger train broke 150 rails near Savanna, Ill. On January 14, on a line in South Dakota, two steel wheels with flat spots on different trucks of a dining car broke 500 rails. On January 24, on a line in New York state, a flat wheel on an observation car broke 15 rails. On January 20, on a line in New York state, a flat wheel on a fast train broke nearly 100 rails. In February, a fast train on a line in Ohio having a shelled out steel tired wheel broke 960 rails in 200 miles; at the end of the run the flat spot was found to be 9 in. long. In February, on a line in Indiana, a flat spot on a steel tired wheel under a baggage car broke 50 rails in 70 miles.

A considerable amount of rail breakage was caused on some lines by shelled out and slid flat spots on steel tender wheels when these spots reached a length of 3 to 6 in., and as a rule they were on fast passenger trains. The intensity of the blow from a flat wheel is materially increased by the rigidity of the track when the ballast and substructure is frozen into a solid mass, and for this reason most damage to rails occurs in very cold weather.

Flat spots on driving wheels are liable to damage and break rails even at moderate speeds, because the weight below the springs is so much greater than that of car or tender wheels, and broken rails on several lines have been traced to this cause. There is also direct evidence that driving wheels which are not truly circular have broken rails in large numbers, and this condition becomes so serious in winter that some lines in the northern districts have found it necessary to order a monthly inspection of driving tires over 63 in. in diameter and to make a limit of 1/16 in. difference in diameter, beyond which the tire must be turned. Uneven worn spots 2 ft. long or more on tires 70 in. or greater must also be removed by turning. During the past winter a defective driving tire on a line in Illinois broke over 100 rails on one trip and an equal number on the next trip, and the cause was then definitely located.

The intensity of the blow delivered by a slid or worn flat wheel has been investigated theoretically, and information on the subject will be found in a paper on Flat Spots on Car Wheels, by Prof. C. H. Benjamin, in the Proceedings of the Western Railway Club, November, 1908. His revised conclusions on this subject are: That the wheel is in the nature of a projectile and as soon as the beginning of the flat spot reaches the rail it falls toward the rail impelled by gravity and accompanied by its share of the load. That if this were all, the flat spot would not be a serious menace because at higher speeds there would not be time for the wheel to fall and practically no blow would be struck. That the spring effect changes this, because the spring being interposed between the car and the wheel has only to overcome the inertia of the parts below it and will cause the wheel to fall more rapidly than by gravity. That the swaying of the car may add to this latter effect considerably. That these conditions are such as to make a mathematical solution more or less approximate.

A discussion of Professor Benjamin's paper by H. H. Vaughan, and his elaborate treatment of the subject, will be found in the *American Engineer* for December, 1908, page 475. On account of the uncertainties connected with such calculations, it was proposed to construct a testing machine for the purpose of measuring the effect of the blow from flat spots on car wheels, and Professor Benjamin is now building a machine for this purpose at the Purdue mechanical laboratory.

Neither calculations nor testing machines are necessary to demonstrate the fact that rails can be broken by flat wheels and oblong driving tires, for the experience of the past winter, as shown by the cases above described and many others on record, is the most conclusive and direct proof. This is a test on a large scale, and it is sometimes selective in breaking brittle rails and not those which are more ductile. They may also be broken in this way on the most rigid portions of the track and not on that which is most yielding.

To guard against possible misunderstanding of the foregoing by those not familiar with railway engineering matters, it should be stated that rail breakages are of two distinct classes, those of rails which are sound when put in track and those of rails which have inherent defects. Either a sound or an unsound rail may, of course, be broken by a blow from a flat wheel; but from the standpoint of safety the breakage of an inherently sound rail is unimportant as compared with that of an inherently defective rail. In the case of a sound rail the break is pretty sure to be a clean one, and the rail will ordinarily be held securely in place by the track fastenings until found and removed by the track forces. On the other hand, a defective rail will ordinarily shatter into several pieces, thus destroying the continuity of the track, and giving rise to serious danger of accident. It is for this reason that most serious derailments are due to inherently defective rails. For the

breakages of defective rails—and these are the only breakages that have been considered by the *Railway Age Gazette* in previous recent discussions of the rail situation—the rail makers must be held chiefly responsible; and the remedy is better methods of manufacture. For the breakages of sound rails caused by flat wheels or other defects of equipment—which, as the statistics given herewith show, are not uncommon in severe weather—the railways must, and, in fact, do, accept full responsibility; and the remedy is constant vigilance to remove defective equipment from service and to properly regulate the speed of trains, especially in cold weather.

THE RAILWAY LABOR SITUATION. VI.

IT is true that the rich are growing richer. It is not true in the United States that the poor are growing poorer. But, while the poor are not growing poorer, important, and even ominous, changes have been occurring in the control of property. The number of farms in this country increased from 4,564,641 in 1890 to 5,737,372 in 1900, and to 6,361,502 in 1910. The average number of acres to a farm was in 1890 136.5; in 1900, 146.2, and in 1910, 138.1. These figures indicate a steady increase of persons who own and cultivate land. The social and political history of a nation is largely determined by the number of its citizens who own property. Considered by themselves, these figures seem to give ground for optimism.

But the population figures for the same years do not tell so encouraging a story. In 1890 36.1 per cent. of our population lived in places of 2,500 inhabitants or more; in 1900, 40.5 per cent., and in 1910, 46.3 per cent. These changes are mainly due to the growth of cities. Under modern conditions as the percentage of the urban to the total population increases, the proportion of citizens who own property tends to diminish. The city dweller ordinarily does not own his home. He usually works for wages or salary, and banks his savings or buys life insurance. The banks invest his money in stocks, bonds or commercial paper. The life insurance companies invest their reserves in securities. The depositor or policy holder has a very real interest in the quality of the paper in which his money is invested. But his interest is one of the nature and degree of which he is only partially conscious.

He has no voice in the management of the concerns in which his money is invested, and none of the feeling of pride or responsibility that accompanies conscious proprietorship. He regards the "financial magnates" who control the management of large corporations as their owners, and he reads or talks of the concentration of wealth in the hands of the few, when the concentration is much less that of wealth than of the management of wealth. People used to say that Mr. Harriman "owned" railways capitalized for more than a billion dollars. When he died he owned, perhaps, 10 or 15 per cent. of a billion dollars. Regarding these large accumulations by a few of power over wealth as the accumulation of wealth itself, and having no feeling of proprietorship in the soil, the factories and the railways of his country, the average wage and salary worker grows disposed to adopt, in co-operation with others, whatever measures seem to him calculated to redress the balance of prosperity. Hence, largely, unreasonable demands and conduct by labor unions; hence, so-called "progressivism," socializing reform movements and the trend toward socialism.

The railways of the United States are the most conspicuous victims of this situation as to the control of corporate wealth and the tendencies, political and social, it produces. Frequently there is published a short list of the names of the men who are said to "own" the railways. In fact, directly and indirectly, the ownership of the railways is widely diffused. But the wage or salary worker whose deposits in banks and premiums in life insurance policies have been invested in railway securities, including thousands of the employees of railways, don't know that they are among the owners of the railways, and are wanting in any feeling of proprietorship in them. Perhaps nothing could more change the attitude of railway employees and the public toward the roads than a wide diffusion, especially among the employees, of the direct ownership of railway bonds and stocks. Suggestions for attempts to get employees to invest in railway securities often have been advanced. Some have been made. But they have met with little success, and under present conditions many railway managers think that while, theoretically, a widespread diffusion of securities among railway employees would be desirable, practically, it could not be obtained.

Some large industrial concerns are not so easily discouraged. The measure adopted by the United States Steel Corporation to get its employees to invest in its securities are familiar. Two large railway supply concerns have recently adopted plans for the sale of stock to their employees. Six of the largest stockholders of the Baldwin Locomotive Works contributed shares to a fund, and offered to employees selected by them one share of 7 per cent. cumulative preferred stock and two shares of common stock for $200 for the three shares. Payment in cash might be made at the time of subscription, thus rendering the ownership absolute; or the employee could give his note for ten years with interest at 4 per cent. for so much of the purchase money as should be unpaid. The purchaser is credited with all dividends declared, out of which are paid the interest on his note; and any residue of dividends is credited on the principal. Shares not fully paid when the subscription is accepted will be held as collateral until full payment. Ample provision is made for the protection of the purchaser and his heirs, in case of his discharge or death, or the dissolution of the company.

The Union Switch & Signal Company last year offered stock to its employees, excepting its directors and general executive officers. Each had the right to subscribe for an amount governed by his total compensation during the year prior to the adoption of the plan. The stock was issued at $75 per share. Payment may be made in instalments covering a maximum of 50 months, and cash dividends accruing in the meantime will be credited to the purchaser's account, except that no dividends will be credited until 24 per cent. of the total purchase price has been paid in minimum monthly instalments of 2 per cent. The privilege is also offered to those who continue in the company's service, after completing payment for stock purchased under this plan, to receive non-transferrable "participation" certificates, on which they will secure "substantial profits in addition to dividends paid to other stockholders through the repayment of one-third of the purchase price of $75 per share by means of 'special participation dividends' at the rate of $5 per share per annum for a period of five years, thereby eventually reducing the actual cost of stock purchased by employees to $50 per share." Employee stockholders may, after the date of final settlement, surrender "participation" certificates and receive for them regular stock certificates. But the acceptance of regular certificates, which can, of course, be sold and transferred, will involve the surrender of any rights under the plan additional to those enjoyed by ordinary stockholders. If an employee stockholder shall cancel his subscription before his stock shall have been fully paid there will be returned to him the exact amount of his payments (otherwise than by dividends credited) with interest at 5 per cent. If the monthly payments required shall be discontinued for three months without the written consent of the company it may close the account. Stockholders whose employment is suspended by temporary closing of the works will not be deprived of their rights, and if the period of suspension exceeds three months in the aggregate it will not be counted as part of the period of 50 months in which full payment of the subscriptions must be made.

The foregoing summarizes very briefly, and perhaps inadequately, the plans adopted by these two great railway supply concerns to give employees a proprietary interest in their business. Doubtless they were largely moved to this step by the belief that to obtain the most efficient and loyal service from employees they must make them co-proprietors. The interest shown by the employees of the Union Switch & Signal Company

is indicated by the fact that, while they were offered only 1,000 shares, 637 of them subscribed for 2,724 shares, all of which were finally allotted.

It is impossible to see why a railway cannot do what can be done by the Steel Corporation, the Baldwin Locomotive Works, or the Union Switch & Signal Company. Those who discuss the relations of railways and their employees sometimes talk as if all employees are arrayed in an attitude of antagonism to the roads and their managers. While, when questions of wages or conditions of employment are pending, members of the brotherhoods act as a unit, there are many thousands, both organized and unorganized, whose relations with the managements are most amicable and who have a sense of pride in and loyalty to the roads with which they are connected. Even the most loyal would not accept the opportunity to subscribe for stock or to buy bonds in lieu of changes in their wages or conditions of employment to which they thought themselves entitled. But if a real opportunity to buy securities were given, and the facts indicating their value were lucidly presented, it is hard to believe that there would not be a large number who would take advantage of it and that this number would not steadily grow.

There are other ways in which the railways and their employees can financially co-operate. The Rock Island and the Illinois Central have recently placed their law departments at the disposal of such of their employees as may have fallen into the toils of loan sharks. The Baltimore & Ohio long has conducted a building and loan association through which employees have been able to borrow money to build or acquire homes at a low rate of interest. Whatever makes the employee a better citizen will make him a better employee. And certainly no means of helping him to become a better citizen can be more effective than that of giving him a chance to acquire a real, financial stake, either in the form of an interest in the business with which he is connected or in the home in which he lives. It is true many co-operative plans have been partially or wholly unsuccessful. But a good many have been successful. Even if every past one had been a failure, that would be no conclusive argument against trying new experiments. The strongest bulwark against socialism in this and every other country is the farmers who own their own land; and a large increase in the number of salary and wage workers who were property-owners would provide another strong and much needed bulwark against it.

DENVER, NORTHWESTERN & PACIFIC.

THE history of the Denver, Northwestern & Pacific, for which receivers were appointed last week, forms an interesting comparison with the story of the Kansas City, Mexico & Orient. Each road was conceived of, promoted, and built, by one man in opposition to existing railway interests.

The Denver, Northwestern & Pacific was projected from Denver, Col., through the Rocky mountains, to Salt Lake City. While the road was to open up a rich section of Colorado heretofore without railway facilities, its most interesting object was to form a part of a new transcontinental transportation route independent of the Gould, the Harriman or the Hill lines. The road was projected by David H. Moffat, president of the First National Bank of Denver, and a financier of considerable local prominence. It was his ambition to build a line which should be a competitor of E. H. Harriman's Union Pacific, and Mr. Moffat was quoted on many occasions as ascribing many of the difficulties of the project to the fact that it was bitterly opposed by E. H. Harriman. On the face of it, it would not seem unnatural that Harriman should oppose the building of such a line.

The remarkable thing about the building of the road was the cheapness of the cost of construction. It is estimated that it cost about $60,000 per mile, which for a line through the Rocky mountains is very cheap indeed.

At the end of 1909 there was outstanding $10,940,000 4 per cent. 50-year bonds due 1952, and there was authorized $10,000,000 5 per cent. non-cumulative preferred and $10,000,000 common stock. In May, 1909, the Colorado-Utah Construction Company which was building the road, sold to Hallgarten & Company, New York, and George H. Burr & Company, Chicago, $4,000,000 6 per cent. notes of 1909-1911, guaranteed principal and interest by D. H. Moffat and secured by the deposit of $8,000,000 first mortgage 4 per cent. bonds of the D. N. W. & P. Presumably the $10,940,000 bonds mentioned as outstanding at the end of 1909 included the $8,000,000 deposited as collateral for the construction company notes. The road, after various difficulties, both of an engineering nature and of a financial nature, was built as far as Steamboat Springs, 214 miles west of Denver.

Shortly before May 1, 1911, when the construction company notes fell due, D. H. Moffat died, and on May 1 the interest on the notes was paid, but the principal, which was also due, was not paid. A company, the Denver Securities Company, was formed to take over the Moffat estate interest in the road. The Securities company had an authorized capital stock of $10,000,000, and took over $8,232,000, half common and half preferred, stock owned by the Moffat estate and offered $5,000,000 of its own stock for sale for $750,000 cash. (This sale would have made an interesting study for the Hadley Securities Commission had they had an opportunity to question those making the sale.) Of this cash, $500,000 was paid to holders of the $4,000,000 6 per cent. notes of the Construction company, giving the holder of each $1,000 note $125 in cash and $875 in purchase money collateral trust 6 per cent. notes of the Denver Railway Securities Company. An attempt was then made to reorganize the Denver, Northwestern & Pacific, and to sell it to some other railway interests or to persuade some eastern banking interests to take up the financing. It was rumored early this year in Denver that Kidder, Peabody & Company, of Boston, were about to become interested, but nothing more has been heard of this rumor.

The earnings of the road are not reported to the Interstate Commerce Commission, but since receivers both for the Securities company and for the railway have been appointed, presumably the road, extending only as far as Steamboat Springs, as it does, has not been able to earn its fixed charges. The difficulties of operation of the road in winter have been very great, and there is some doubt as to whether or not it will ever be possible to operate the road on a profitable basis unless a four-mile tunnel is driven through the continental divide. A bill has passed the Colorado legislature providing for the financing of this tunnel by the state, but nothing further has been done and no steps have been taken to issue bonds or in any way raise the money. With this tunnel built and an extension to Salt Lake made there will still be the question of finding traffic relations at the two ends which would provide through business. The road between Denver and Steamboat Springs runs through some coal fields, of which the full value is not known. It might not be impossible to establish traffic relations at the eastern end of the road, if it is completed, with a road terminating at Denver, like the Chicago, Rock Island & Pacific, or with a road like the Burlington, which possibly could advantageously ship San Francisco traffic over such a route. At Salt Lake, however, it would have nothing but direct competitors with which to exchange traffic.

How much of Mr. Moffat's personal fortune went into the building of the road it is impossible to say accurately, but estimates have placed it at over $7,000,000. Mr. Moffat was accused of building the road simply to force one of its competitors to buy it. On the other hand, there are many indications that it was built partly through personal ambition, partly in an attempt to prove to those who refused to enter into the project that it could be done and done profitably, and partly to develop a rich part of Colorado, in which Mr. Moffat presumably had interest, and to develop the city of Denver, in which Mr. Moffat had a very large interest. Insofar as it was built by independent parties, its projection was in a way analo-

gous to that of the plans of the Kansas City, Mexico & Orient; but certainly, from a study of the map alone, the economic need and necessity for such a line is by no means so clearly shown in the D. N. W. & P. case as in the case of the Stilwell road. It will be interesting to follow the reorganization of these two properties—the D. N. W. & P., and the K. C. M. & O.—the one with an originally strong local financial backing but without an apparent economic necessity for its construction; the other with very little but brains and selling ability as capital to start on but with a real possibility of developing new traffic and new country.

NEW BOOKS.

Railway Statistics of the United States for the Year Ending June 30, 1911. Prepared by Slason Thompson, Bureau of Railway News and Statistics, Chicago. 126 pages. Bound in paper.

This is the eighth issue of Mr. Thompson's annual pamphlets, in which he compares statistics which he has gathered with the statistics of the Interstate Commerce Commission and recent statistics of foreign railways. The statistics gathered by Mr. Thompson himself and herein presented for the railways of the United States are those of railways operating 232,117 miles of line, and are based on the situation as of June 30, 1911. "While the mileage reported to the bureau," says Mr. Thompson, "covers slightly over 95 per cent. of the total of the United States, by reason of its location and nature, it carries more than 97 per cent. of the traffic." The statistics of the commission with which Mr. Thompson's own statistics are compared are those for the year ending June 30, 1910, and the statistics of foreign railways given are for years varying from 1908 to 1911, although some statistics for earlier years than these are given for the railways both of the United States and several foreign countries.

Proceedings of the Forty-Fourth Annual Convention of the American Railway Master Mechanics' Association, held at Atlantic City, N. J., June, 1911. 516 pages. Cloth. Published by the association, J. W. Taylor, secretary, 390 Old Colony building, Chicago. Price, $2.50.

Reports and papers on the following subjects presented at the last convention are given in full in this volume: Mechanical stokers; smoker consuming devices for terminals; construction of locomotive frames; main and side rods; formulae for designing piston rods and crossheads; equipment for engine houses; best method of treating feed water when water treating plants are not practicable; lubrication of locomotive cylinders; locomotive performances under different degrees of superheated steam; safety appliances; design, construction and inspection of locomotive boilers; contour of tires; flange lubrication and standards. Full specifications and drawings of the standards of the association are included; also the list of members and their addresses, the committees and subjects for the next meeting, and the constitution and by-laws of the association.

Proceedings of Thirteenth Annual Convention American Railway Engineering Association. Published under the direction of the Committee on Publications. 7 in. x 10 in. 1,300 pages (including inserts). Price, paper cover, $5; cloth binding, $5.50; half morroco, $6.

Although the convention of the American Railway Engineering Association closed less than six weeks ago, the bound proceedings are now ready for distribution in paper covers, and it is expected the cloth and half morocco bindings will be ready by May 15. This promptness of publication will be very much appreciated by members accustomed to wait several months after the convention to receive the official proceedings.

Several radical changes in the publication of the book have been made this year. The volume of the reports submitted by committees during the past few years has grown to such an extent that in 1910 the proceedings were separated into two volumes, and it was necessary to use three volumes in 1911, containing an aggregate of over 1,800 pages. All committee reports for the present year were kept down to the shortest possible length, enabling the entire proceedings to be included in 1,300 pages, including inserts. The paper stock on which the book is printed was imported from Europe and is light enough in weight to make the total thickness of the 1,300 pages only about 20 per cent. greater than that of a single volume of last year's proceedings, although the quality of the paper is fully up to standard. This decreased size of the year's publications effect a large saving in binding and will also economize in shelf room needed for the books.

A very great economy in the cost of publication was effected by holding the pages set up for the advance notices to be used in the proceedings. This made it necessary to publish the discussion of all committee reports together following the reports themselves, and also to publish a short list of amendments which were made to committee reports during the discussion at the convention. While there may be some slight inconvenience due to this arrangement, the complete table of contents and index and cross references which accompany both the discussion and the report make it perfectly easy to use the volume. A new feature of the book is the publication of the list of speakers taking part in discussions at the head of the section devoted to the discussion of each committee report. As it is very frequently desired to refer to information which is known to have been given by a member in discussion, this means of locating his remarks will be found very useful. The book also contains the three monographs which have been published by the association during the past year.

The Full Recognition of Japan. By Robert P. Porter. 778 pages, seven colored maps, 6 in. x 9 in. Bound in cloth. Published by Henry Frowde, London. Price, $4.

In view of the universal interest now being taken in the affairs and progress of the Japanese empire, this book, a detailed account of the economic and political progress of this remarkable nation drawn from extended observation and the latest printed documents and reports, should command attention. Readers of the *Railway Age Gazette* will be especially interested in the chapters on trade, commerce and shipping and on railways, in both of which the author has given a careful analysis of present conditions and tendencies. In the chapter devoted to the railways Mr. Porter states that while he has never been convinced that railways are more efficiently managed when in the hands of the state than when under private control, he is willing to admit that Japan has carried out a policy of railway nationalization on a plan of unexampled economy and efficiency. This he attributes to the fact that a noteworthy public spirit has been manifested by the officials, from the highest to the lowest, and that their idea has been that the railways should not only be made self-supporting, but that all extensions and improvements should be paid for out of earnings and not from loans. The state operates 4,879 miles of railway, with capital obligations amounting to £62,547,000, or about $300,000,000, while there are 506 miles representing a capital investment of £4,676,944, or about $22,000,000 remaining in the hands of private companies. Japan is now confronted with the necessity of converting much of the original narrow gage railways to standard gage. The chapter includes a brief history of railway development in the country, outlines the present railway situation, and discusses at considerable length the principal features of the government's plans for financing the extension and improvement of the system which have been decided on as a necessary public policy.

Mr. Porter has had the best of opportunities for studying contemporary Japanese affairs, conditions and developments, as, in the course of his extensive travels in and observation of the situation in various countries, he made a long visit to Japan fifteen years ago, and another a short time ago, on which he had access, not only to all the official public documents that would be useful to him, but also to many special reports that were prepared expressly for his information. Being a trained observer and an experienced and able writer, he was able both to see and learn the things that the people of other countries want to know about Japan and to tell them in a style that is always lucid and interesting.

Letters to the Editor.

DEFECTIVE BOX CARS AND DAMAGED FREIGHT.

SAVANNAH, Ga., April 24, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have been very much interested in reading the articles on defective cars and damaged freight, and cannot help but believe that by calling the attention of the railway public to this matter the necessary reforms will be brought about.

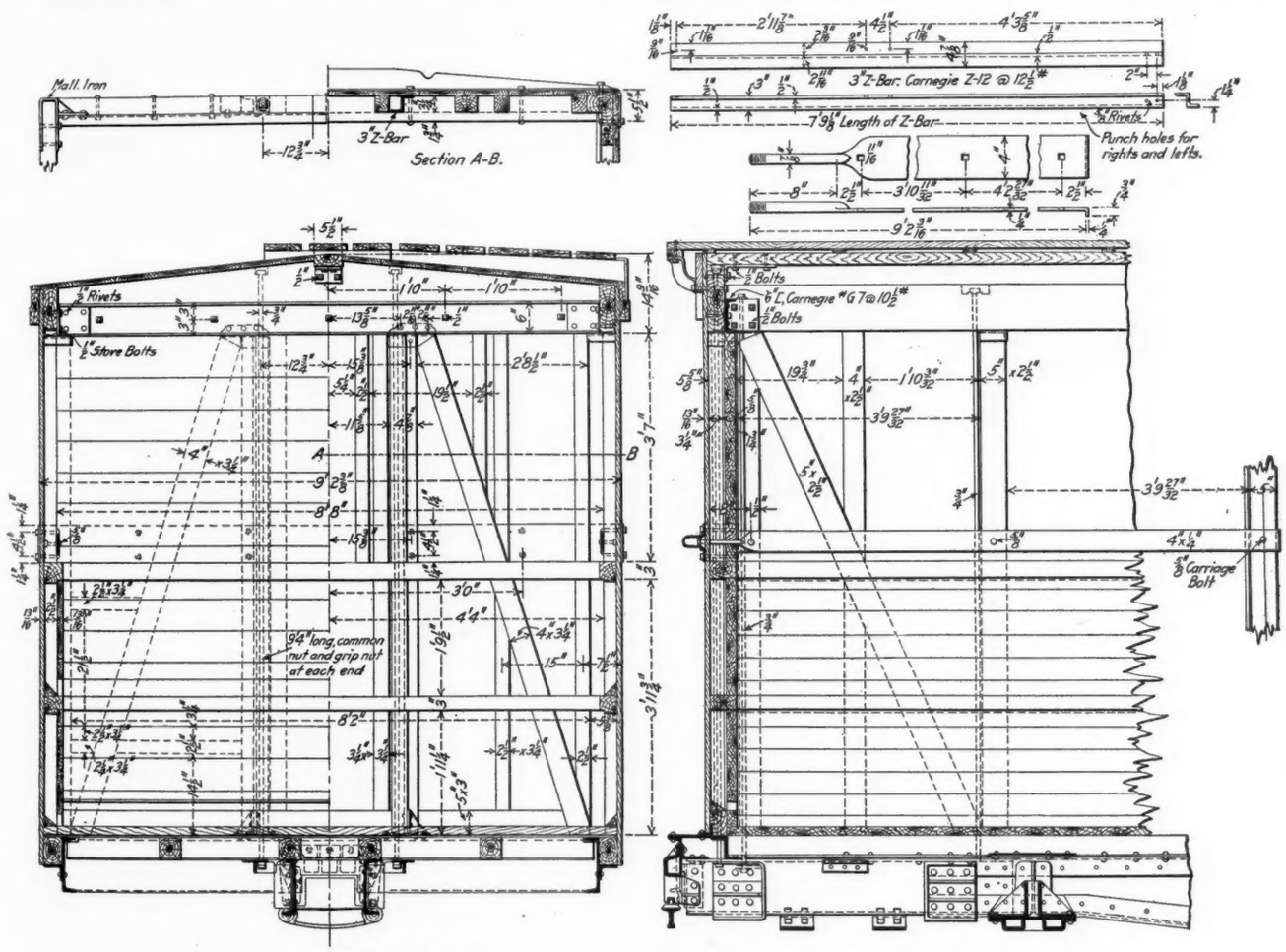
A cause of loss and damage, which is touched upon but not amplified as it should be, is the rough usage cars receive at terminals, hump yards, etc. A very large percentage of loss is due to rough handling, as is evidenced by the tearing out of the ends and shifting of the loads. This cannot help but result in considerable loss, and to a certain extent could be remedied by very much better end construction in box cars than is commonly used. The accompanying drawing shows the end construction of some box cars which we built a year ago at our Macon shops, in which I carried out this plan of reinforcement, and after quite considerable service from these cars I believe it will prove a very substantial economy in the maintenance of the cars and keep down the damage to freight.

Wooden draft timbers and light draft gear are also fruitful sources of damage to lading by tearing out end sills and sheathing. Nails used for cleating lading, nailing car doors, etc., are another source of damage to lading, especially when the packages are made up of sacks. We have had a campaign on this matter for the past year, and have provided all agencies and car inspectors with a special type of pulling bar for removing the nails.

Another item that causes considerable damage is leaky roofs. An inspection at any terminal on a rainy day will reveal a very high percentage of leaking roofs.

While many of the railways are aware of all of these defects that lead up to loss and damage to freight, and are striving to overcome them in new equipment and in repairs to old equipment, I must confess that a majority of them are not doing so, if the average conditions that are found in any large yard are to be taken as evidence.

F. F. GAINES,
Superintendent Motive Power, Central of Georgia.



Strong End Construction for Box Car; Central of Georgia.

An interesting experiment in the use of oil fuel for locomotives is being made by the Caledonian railway, Scotland. At the locomotive works in Glasgow an engine has been fitted up with oil-burning apparatus. The oil is stored in a cylindrical tank placed on the tender in a part of the space usually occupied by coal. The oil flows from the tank to the engine injectors, which force it into the firebox at two points about 18 in. apart, where a current of steam from the boiler causes it to assume the form of fine spray spreading itself through the firebox. By means of a thin layer of wood or coal fire covering the firebars this spray is ignited, and so generates steam for the motive power as well as for the injecting and spraying. The extent of the flame is regulated by a valve on each of the injectors. The firebox, in addition to the customary firebrick arch, is equipped with a firebrick wall to protect the copper front plate from the effects of the great heat produced by the oil fuel. The special fittings are such as to permit of the engine using oil or coal. On a trial non-stop run from Glasgow to Stirling and return the engine consumed 1½ gal. of crude oil per mile; drawing a full train it is estimated that the fuel consumption will be 3 gal. per mile.

THE FLORIDA EAST COAST EXTENSION.

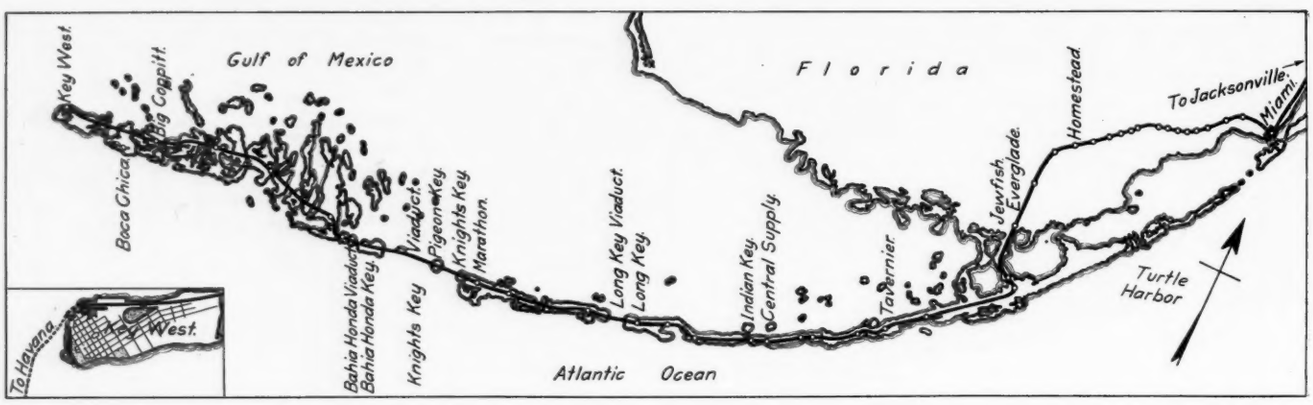
History of the Key West Project; Details of the Novel and Difficult Construction; Operating Prospects.

BY FRANK M. PATTERSON.

With the inauguration of traffic over the entire Florida East Coast Railway's Key West extension, on January 22 of the present year, came the realization of plans long nurtured by H. M. Flagler. Beginning his railway acquisitions in a modest way Mr. Flagler purchased in 1885 a small decrepit road extending from Jacksonville, Fla., to St. Augustine to improve the service to the latter place whither he had gone in 1883 for rest and recreation. He found St. Augustine a sleepy southern town with a delightful winter climate and became interested in its possibilities as a winter resort, as well as in the possibilities of the entire east coast, both as a winter play-ground, and as a fruit and vegetable growing section. To properly develop the country he purchased two additional railways south of St. Augustine giving him access to Palatka on the St. John's river and to Daytona on the coast, consolidated them with his original purchase and pushed them southward until in 1896 the Florida East Coast Railway entered Miami, situated on Biscayne bay, 366 miles south of Jacksonville. Biscayne bay has practically all of the attributes of a first class harbor except water, the natural depth being only about 12 to 14 ft. Here construction stopped; steamer lines were established to Nassau, Key West and Havana, Cuba, and it seemed that Miami would remain the southern terminus.

However, the growing importance of our trade with Cuba, after the Spanish war and the certainty of the construction of the Panama canal led to the determination to extend the railway to some point where satisfactory harbor facilities could be obtained. The railway had been extended to Homestead, 28 miles south of Miami, in 1904, and from the latter point surveys were made to Cape Sable, the most southerly point on the mainland, about 100 miles from Homestead. The route lay wholly in the Everglades and was rejected after a thorough investigation. The next survey was made to Turtle Harbor, but this plan was abandoned also, and it was decided in 1904 to build to Key West, a distance of 128 miles of which about 22 miles was on the mainland and the remainder across the string of keys or small islands that fringe the coast and extend beyond the mainland to deep water at Key West. Construction was started in 1905.

As far as Knight's Key the islands are admirably situated for the location of the railway, affording good alinement and necessitating comparatively little bridging, the longest stretch of water being at the lower end of Long Key where a concrete viaduct two miles in length was built. Immediately below Knight's Key is a stretch of water seven miles wide ranging in depth from 18 to 22 ft. A few miles further on Bahia Honda is encountered,

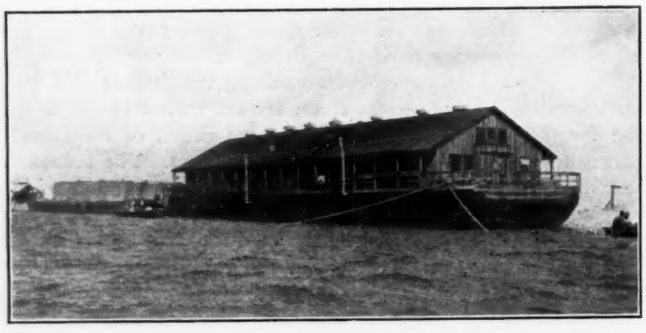


Key West Extension of the Florida East Coast Railway.

where a bridge 5,100 ft. long is required, in water whose greatest depth is 30 ft. The three structures just referred to, together with a concrete arch bridge, 2,573 ft. long at Boca Chica, a few miles north of Key West, were the principal bridges as originally planned, although later it was found necessary to provide additional arch structures to which reference will be made later.

Owing to the comparatively favorable conditions above Knight's Key and the large amount of bridging below that point it was determined to establish a temporary dock at Knight's Key. Traffic was opened to this point in February, 1908, and steamer connections made to Key West and Havana, displacing the service previously maintained between Miami and the latter points.

The construction on the extension resolved itself into three

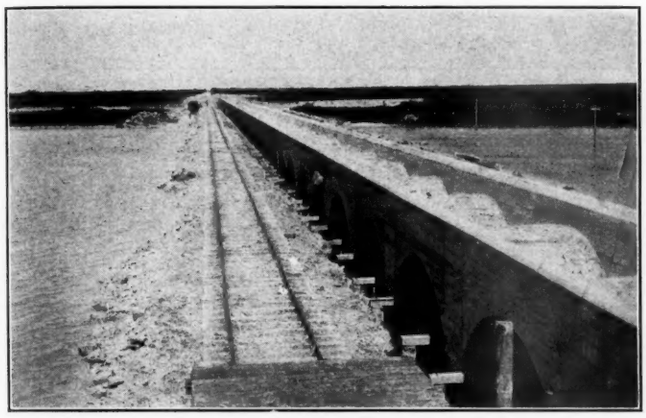


Quarter Boat for Housing Men.

Temporary Dock and Approach at Knight's Key.

methods: grading across the Everglades and other submerged sections, grading across the keys and bridge work. On account of the conditions under which the construction had to be done and the desirability of having all labor under the undivided authority of the railway none of the work was let by contract, the company assembling equipment and perfecting an organization under the direct supervision of the constructing engineer.

From the nature of the work practically all of the outfit used on the original construction was floating equipment and this included a number of Mississippi river steamboats of the stern-wheel type, which proved most efficient for the transportation of material and supplies in the shallower waters, owing to their light draft. All material and supplies, including water for domestic and boiler use, had to be brought from the mainland.



Temporary Trestle Alongside Permanent Line.

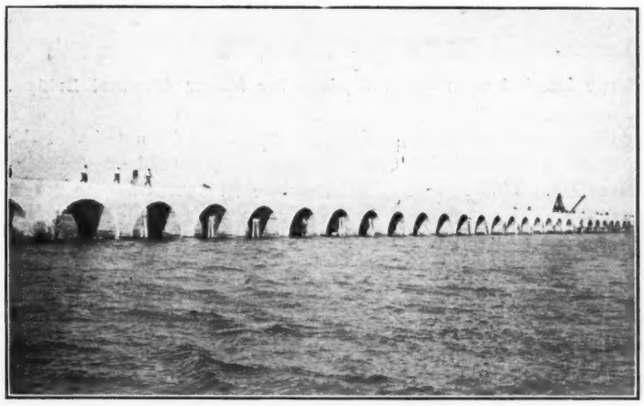
Material for concrete was shipped by steamer from northern points, trap rock being brought from the Hudson river, sand from Baltimore and American Portland cement from New York. German Portland cement was used in all concrete below high tide, being delivered by tramp steamers at the nearest available harbor.

From Homestead to Jewfish Creek, where the line leaves the mainland and crosses to Key Largo, the location lies entirely in the Everglades and the grading was done by means of floating excavators using a boom and orange peel bucket to excavate material from the sides and deposit it in the embankment. When open water was reached the dredges were towed to other places where their services might be needed.

On the keys proper most of the grading was done by hand labor. The material is coraline rock with little or no overburden of dirt. This rock is light and easily worked and the quantities per mile averaged small. Where the embankments were too high to be built economically by hand labor the excavators were taken from their scows and placed on the embankment, moving forward on rollers as they completed the work ahead of them.

BRIDGE CONSTRUCTION.

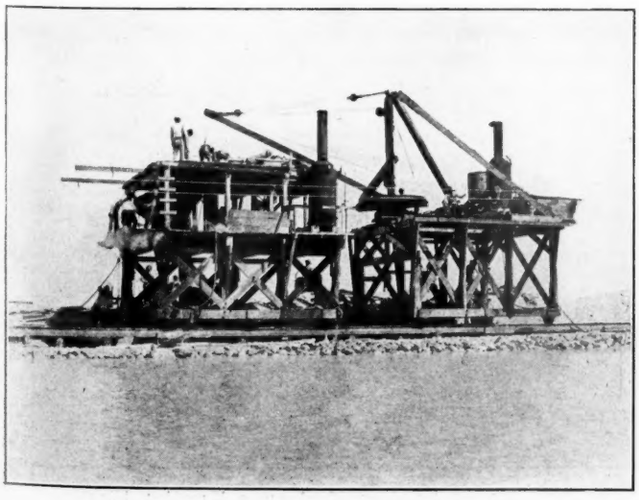
Five permanent bridges were put in between the mainland and Knight's Key: a drawbridge at Jewfish Creek, single steel spans at Tavernier Creek, Snake Creek and Wilson's Key and the concrete arch bridge at Long Key. The drawbridge is deck girder swing span, 99 ft., 6 in. long and is operated by hand. The center used is somewhat unusual, being rimbearing with drum between flanges of main girders. In addition to these structures, several pile trestles were put in where the water was comparatively shallow, to be replaced later by concrete arches.



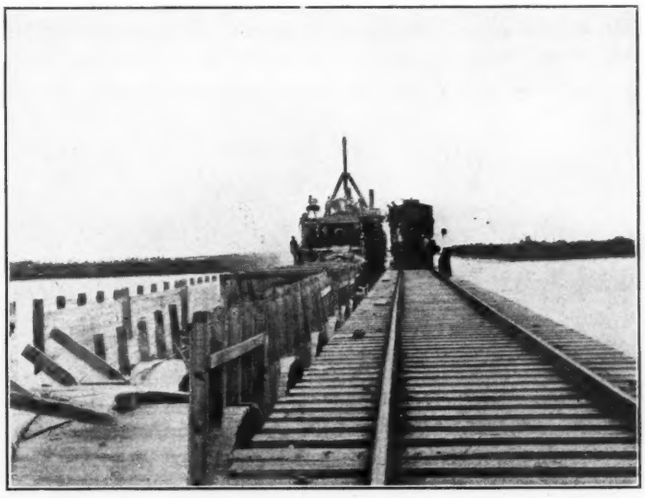
Boca Chica Arch Viaduct.

The Long Key viaduct is the longest structure of the arch type on the line and is a notable piece of work, consisting of 180 semi-circular arches of 50 ft. span, the track being at an elevation of 30 ft. above high tide. The method of construction used here has been followed on all similar work and a description of it will serve for all.

The location of piers having been established the sand was removed from the rock bottom by dredging and a cofferdam floated into place and sunk. Piles were then driven into the rock to refusal, the average penetration being 12 to 14 ft. The purpose of the piling was three fold: first, to afford foundation should any erosion of the rock occur; second, to act as an anchor against any tendency to overturning or lateral displacement; and third, to act as an exploratory probe. It happened several times that cavities in the rock were encountered that had been missed by the sounding outfits. After the piles were driven a footing course of concrete from 3 to 5 ft. in depth was deposited by

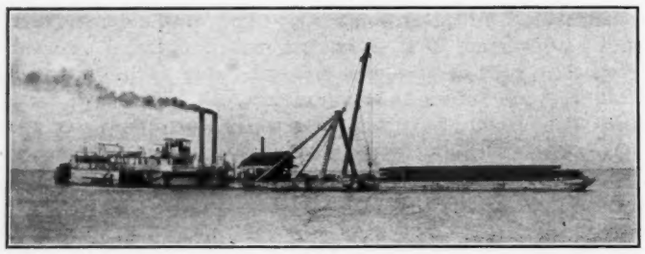


Side View of Traveling Concrete Mixer Outfit.

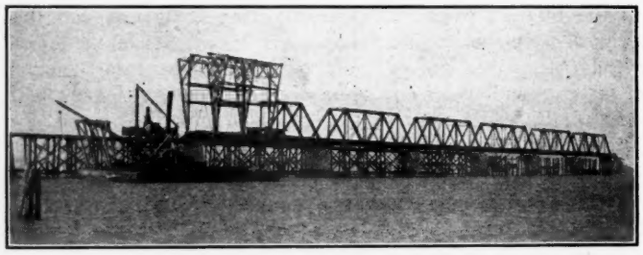


Building Concrete Arches with a Traveling Mixer.

tremie and allowed to set, forming a seal. The cofferdam was then unwatered, the piling cut off to a point well below low tide and forms erected for the piers. After the piers were completed to the springing line false work for the arch forms was driven and the forms put in place. To avoid expansion cracks the arches were put in alternately, the concreting being done by mixers and derricks on scows. A plan of these arches is shown in the occompanying figure from which it will be noted that the arch is so designed that little dependence is placed on the reinforcement. This is true of all concrete structures on the entire line, as it was not thought wise to take any chances of corrosion of the reinforcement from the salt water, and weight was desired to withstand the action of the waves.

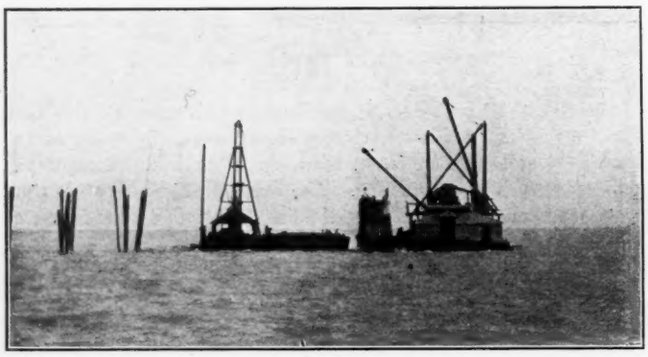


Barge Loaded with Steel Girders for Moser Channel Bridge.

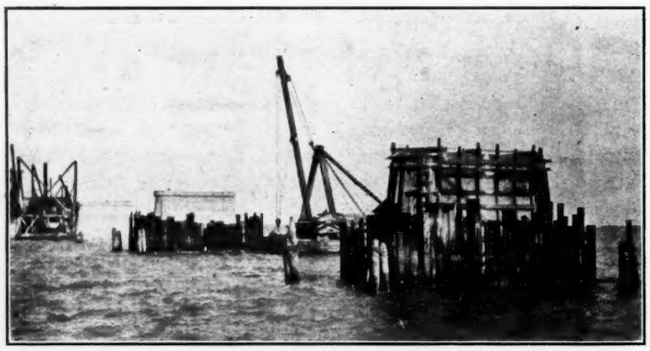


Erection of Bahia Honda Bridge.

Below Knight's Key the rock changes from coraline to a highly fossiliferous sedimentary limestone, and it was found possible to use it for concrete, thereby effecting a saving in the cost of concrete of from $3 to $5 per cu. yd. The rock is blasted in shallow water and loaded by orange peel dredges. When blasted it breaks up into small sized pieces with enough fine stuff so that it can ordinarily be used as it comes from the dredge without the addition of sand, or any sorting other than the removal of occasional large chunks.



Driving Piles with Floating Driver.

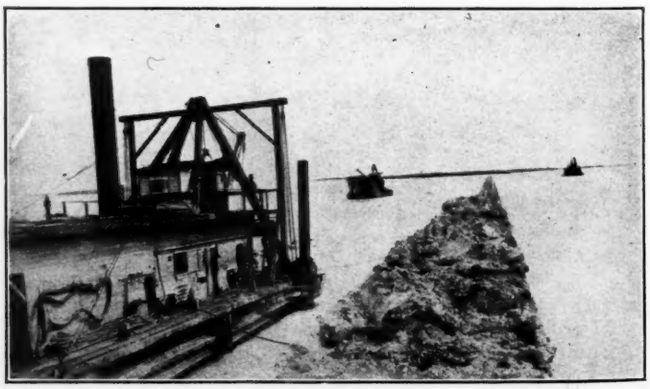


Completed Piers, Bahia Honda Bridge.

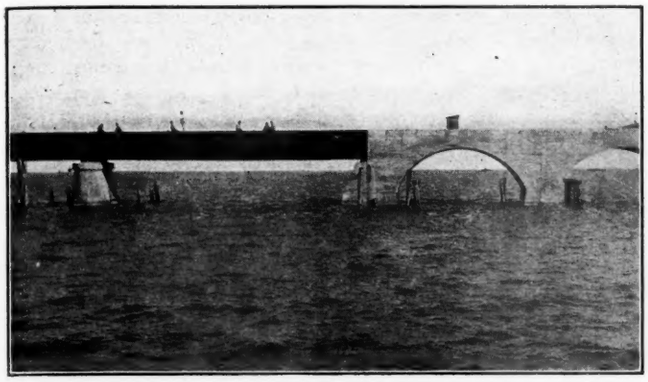
In driving piles through this limestone it was found that the top for a distance of from 3 to 5 ft. was harder than the underlying material and that it was necessary to punch holes through this crust before the piles could be driven. For this purpose a steel rod or bar was used, fitted with a driving head and cushion and was hung alongside the leads where it could be swung into place readily. This served admirably as a punch, but difficulty was found in withdrawing it on account of the side friction, which was obviated by fastening a collar 2 in. thick by 6 in. long around the lower end of the bar. This arrangement worked well with the floating drivers, but with the track drivers a further modification was necessary, as the force needed to withdraw the punch was enough to threaten overturning of the driver on any but a direct pull in line with the center of the track. A way out of the difficulty was found by using 2 in. x 2 in. bar iron bent to the form of a ring with a diameter slightly larger than the punch. This ring was then slipped over the lower end of the punch and fastened only enough so that it would not drop off until the punch was driven. The use of the punch and loose ring has shown a saving of about 50 per cent. over the cost of pile shoes besides being more efficient.

On account of the depth of water at Knight's Key the use of deck girders was decided on, and for the same reason through truss spans were used at Bahia Honda, the depths of water being as previously noted 18 to 22 ft. and 20 to 30 ft. respectively. The methods of pier construction were as previously described,

Gasolene Excavator Removing Washed Out Embankment, Preparatory to Building Concrete Arches.



Clamshell Dredge Loading Marl on a Trestle; Florida East Coast Extension.



Connection of Girder and Arch Structures, Knight's Key—Moser Channel Viaduct.

except that Friestedt and United States steel interlocking sheet piling was used for cofferdams at the Bahia Honda bridge. The sheet piles were driven several feet into the rock and the sealing course deposited over the entire area of the cofferdam. Little difficulty was met in pulling the piles, one or two blows of a pile driver being enough to loosen them from the concrete.

Knight's Key bridge consists of 316 80-ft. and 19 59-ft. 9 in. deck girders with 210 arches of 35 ft. span at the southerly end where shallower water is found, and a 253 ft. 6 in. through truss draw span over Moser channel operated by a gasolene engine.

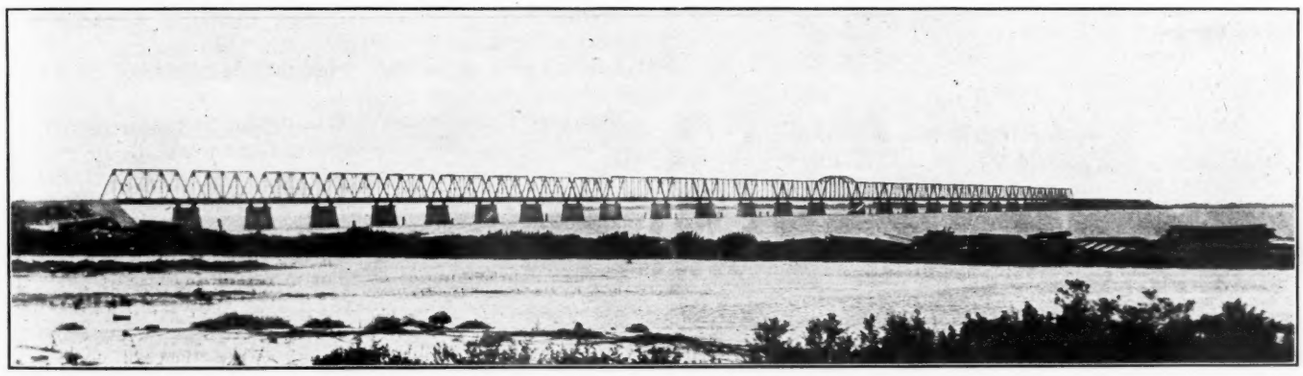
The erection of the girders at Knight's Key was begun by contract, but was taken over by the railway after a comparatively small part had been erected, and the remainder was completed by the construction department. The erection was begun by derrick car, but after the company's forces assumed charge the work was done by means of floating derricks and much faster progress was made, at one time six spans being set in place in four hours, and at another one span being erected in 20 minutes.

Bahia Honda bridge consists of 13 spans of 128 ft. 6 in., 13 spans of 186 ft., 1 span of 247 ft. 6 in., and 9 plate girders of 80 ft. span. The steel work was erected by the company's forces, using false work and overhead traveler, and it is interesting to note that not a life was lost in the erection of either the Knight's Key or the Bahia Honda bridge. The decks of the steel bridges are of the ordinary type fastened with hook bolts.

The protection of the steel spans from rust is one of the hardest problems facing the railway. In the warm, moist, salty air corrosion begins in an almost incredibly short time and no paint has been obtained that can be considered wholly satisfactory. Near the constructing engineer's office at Marathon a test rack is located in which are placed test plates coated with different paints, and so far none has been found that will afford protection for two years. The railway company's standard paint has proved about as efficient as any and on account of its bright yellow color corrosion is quickly detected. The ordinary galvanized telegraph wire rusts through in two years or less, and it even has been necessary to paint the track rails with a coating prepared by the Cunningham formula, consisting of one part kerosene, four parts Portland cement and 16 parts refined coal tar, the cement and kerosene being first mixed and then stirred into the heated tar. The concrete arch bridge at Boca Chica, four miles north of Key West, is the last important bridge on the extension, having 83 arches of 25 ft. span.

At Key West all of the land needed for terminals was made by pumping material by hydraulic dredge, as no land was available on the island. The plans for the terminals are not fully decided upon, but work has been begun on a concrete pier 1,700 ft. long by 134 ft. wide, with a 24 ft. depth of water alongside. One of the accompanying drawings shows the traveller and concrete plant at work on this pier, and a part of the wooden pier now in use. It is also the intention to put in car ferry slips and to transport freight cars to and from Havana, 105 miles distant, to avoid breaking bulk on shipments between points in Cuba and points in this country. A small draw span was put in at Key West to afford access to the basin for small craft. The plans of this bridge reproduced herewith show the design which is somewhat unusual, being adopted to allow the use of some material on hand.

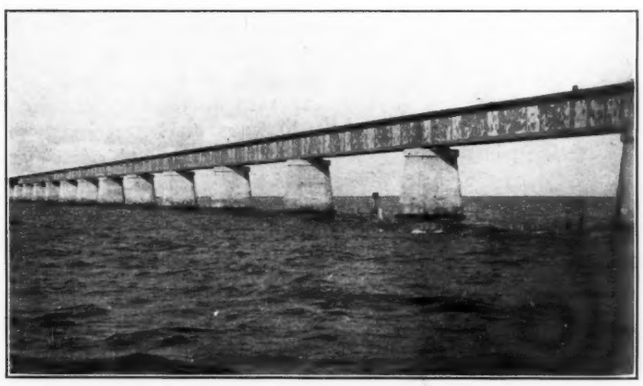
The effect of sea water on the concrete has been closely watched, both in the actual structures and on test cubes exposed for observation, and so far there is no reason to believe that any serious deterioration will take place. Shortly after being exposed to the water it is found that a scaling off occurs to a depth of about 1/16 in. on the part of the concrete between the limits of high and low tide which amounts only to about 18 in. After the scaling off has taken place a marine growth forms on the parts exposed to the water and seems to protect the concrete from further damage.



Bahia Honda Bridge, Only Truss Bridge on Extension.

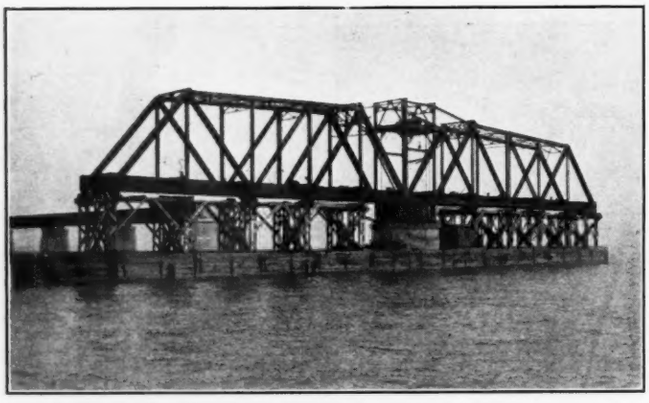
EFFECT OF HURRICANES.

After surveys had been completed and plans made for the construction of the extension it was thought that the bridges already referred to would be all that would be necessary and



Knight's Key—Moser Channel Viaduct.

that solid embankments could be made from key to key in other places. It will be seen from the map that the keys are small and more numerous below Knight's Key than above that point, and it was found that the water between them below Bahia Honda was quite shallow, in some cases being only a few inches in depth. However, there was one factor that had not been considered and one that perhaps never had been encountered before in work of this kind. This is the impounding of the waters of the gulf by hurricanes in that pocket between the railway and the mainland known as the Bay of Florida. The hurricane of 1906, while very severe, came upon the work before those waterways had been closed, and it was not until the storms of 1909 and 1910 that their effects could be noted and studied in this connection. Under the stress of these storms continuing for several days from the south and west it was discovered that the water was banked up in the bay until it overtopped the embankments, and swept them away. It was also noted that the embankments across the water, even in the shallowest places, were the first to go, and that when they were gone the water rapidly subsided. This has led to the decision to build arches, varying from 16 to 25 ft. spans, across these stretches, the length required amounting to a total of between five and six miles. In the meantime pile trestles have been put in on a temporary location alongside the permanent line to carry traffic and also to act as construction track. In one of the accompanying photographs will be seen one of these temporary trestles with a gasoline dredge removing

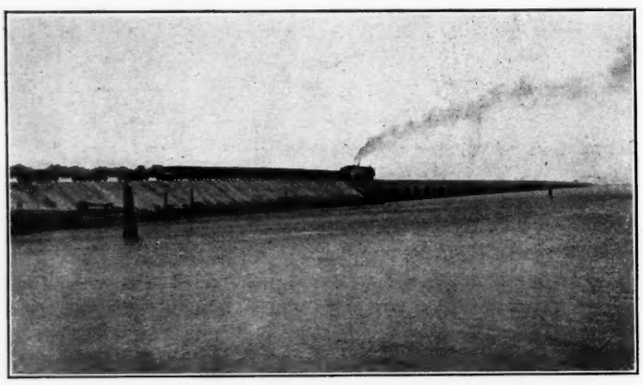


Moser Channel Drawbridge During Erection.

the remains of the old embankment; and another shows the construction of the arches. Especial attention is called to the traveling concrete outfit which is used on all the smaller arches and which has proved a highly efficient method. The embankments were made of rock and the material is loaded on cars and used for ballast or for concrete as required. It is interesting to note that while little trouble is experienced with the toredo, except at Key West where the waters are somewhat infected, the life of a timber trestle is only about three years, owing to rot.

In addition to providing more waterway it has been found necessary to protect the embankments from wave action in exposed places with some other material than riprap. Riprap from 3 to 5 ft. thick was originally used, but the suction of the receding waves carried it away and then attacked the embankments themselves. Deposits of calcareous marl are found at various places in the waters between the keys, and this is being unloaded along the banks where protection is needed. The marl is of such consistency that it takes a natural slope of about 5:1, corresponding very nearly to a beach slope and is dressed off to a smooth surface. After exposure to the air the marl hardens and affords complete protection from the waves. In one of the cuts is seen a clam shell dredge loading Goodwin cars on a trestle, while in the distance are two gasoline dredges throwing in marl to increase the deposit for the loading dredge. One of these trestles is in use at Central Supply where marl is being loaded for use above Knight's Key, and the one shown in the illustration is at Big Coppitt about 10 miles northerly from Key West. Two other trestles for the same purpose are almost completed between Big Coppitt and Bahia Honda. North of Knight's Key the total requirements were about 3,000,000 cu. yds., of which approximately one-half has been placed. South of Knight's Key the requirements will be considerably larger.

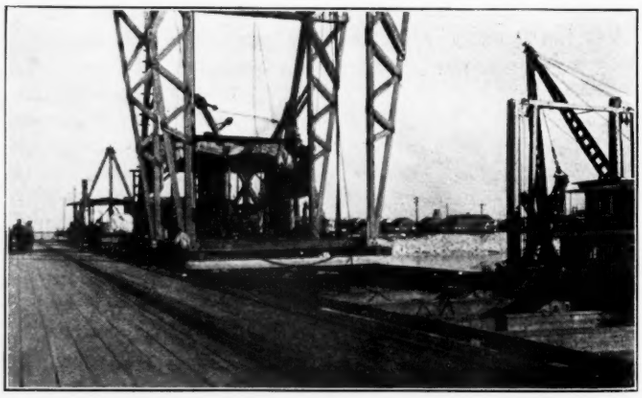
The railway is liable to face a charge of nature-faking while doing this work and if left to a jury of turkey buzzards the



South End of Long Key Viaduct.

charge would be sustained. There is a strong odor of sulphuretted hydrogen when the marl is freshly unloaded and wherever the work is in progress the banks are lined with the buzzards searching for the morsels that their sense of smell tells them should be there.

Reference having been made to the hurricanes, it may be of interest to review their connection with the work. These storms, arising in the West Indies and resembling the East Indian typhoons, may be looked for in August, September and October, but are most apt to occur in the latter month. The greatest loss of life and damage to equipment from this cause occurred in 1906, although that storm was not so severe as those of 1909 and 1910. A hurricane was predicted in 1905, the year the work was started, and strict orders were given by the constructing engineer to prepare for it. It is perhaps unfortunate that the predictions that year did not materialize into a moderately severe blow, for there were fewer men on the work then and a wholesome fear



Traveler and Cement Mixer; Building the Concrete Pier at Key West; Florida East Coast.

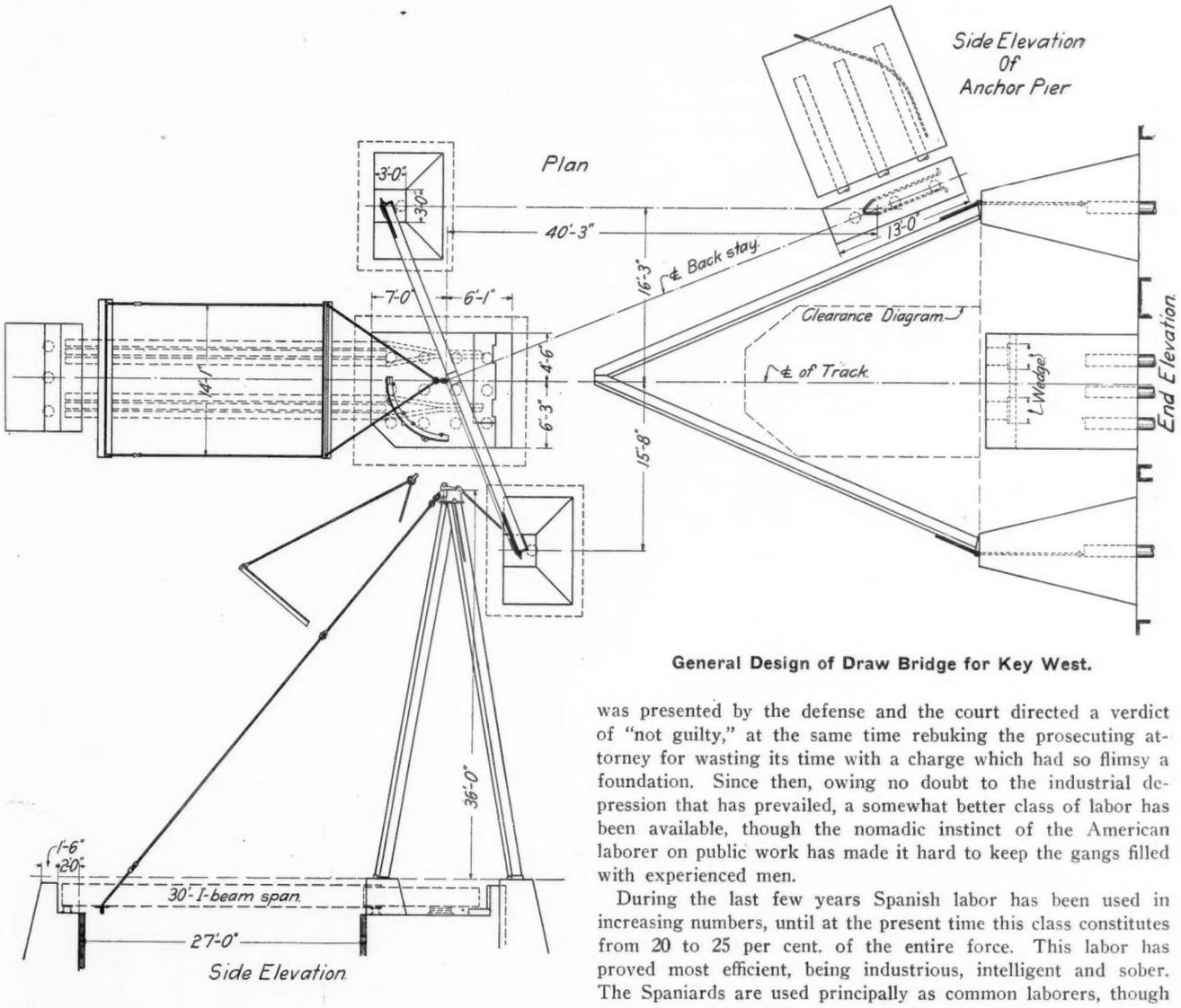
would have been instilled in all. In 1906 when warnings were again issued they were not given much attention except where the constructing engineer and his principal assistant could see personally that they were observed. As a consequence when the storm broke it found the greater part of the men and equipment helpless, or worse than helpless, for most of the laborers were housed in quarterboats and had taken refuge in them. These boats were soon blown out to sea, over 70 men were lost and

many others were picked up by passing steamers after days of suffering. Since 1906 every precaution has been taken to protect lives and property when information of an impending hurricane is received. Each engineer's camp is provided with a barometer and the weather bureau at Washington has given valuable aid and sends warnings promptly whenever it gets reports of an approaching storm. At such times the land equipment is put in shape to stand the storm as best it may, the floating equipment is taken to sheltered places and sunk in shallow water and the men are assembled at such places as will afford the best protection. It is worthy of note that the storms of 1909 and 1910, the most severe known on the coast of Florida, caused little loss of life and equipment.

In 1909 the wind reached a velocity of 125 miles per hour and the lowest barometric reading known in the United States was observed. While much embankment was washed away absolutely no damage was done to any of the concrete work in place. Five girders of the Knight's Key bridge were blown off the piers but this was due to the carelessness of the contractors who had failed to put in the anchor bolts as erection proceeded. Each girder is anchored to the pier with 16 bolts, four to each pedestal, and the contractors had put in only two to each girder at the time of the storm.

THE LABOR QUESTION.

The question of labor has been a serious one and was particularly troublesome in the early stages of the work. The use of negroes recruited from Florida and neighboring states was considered, but the supply was found to be insufficient and inefficient on this class of work. Italian and Greek labor was tried and found wanting, and arrangements were made for securing common labor in New York through labor agencies established by the railway. In spite of the care taken to select only men fitted for the work, much trouble was experienced at first with incompetents and with those who recruited with no idea other than to secure a trip to Florida at the expense of the company. Out of this grew the peonage charges which resulted in federal indictment of the engineers in charge and their New York agent. These charges received highly sensational treatment in the press, but when, after hard fighting, the railway was able to bring the cases to trial, the result was a verdict of acquittal. No evidence



General Design of Draw Bridge for Key West.

was presented by the defense and the court directed a verdict of "not guilty," at the same time rebuking the prosecuting attorney for wasting its time with a charge which had so flimsy a foundation. Since then, owing no doubt to the industrial depression that has prevailed, a somewhat better class of labor has been available, though the nomadic instinct of the American laborer on public work has made it hard to keep the gangs filled with experienced men.

During the last few years Spanish labor has been used in increasing numbers, until at the present time this class constitutes from 20 to 25 per cent. of the entire force. This labor has proved most efficient, being industrious, intelligent and sober. The Spaniards are used principally as common laborers, though many have shown themselves capable of a higher class of work, and have been used as firemen, calkers and stationary engineers.

With the skilled labor little trouble has been experienced, the greatest difficulty having been to secure all around machinists capable of performing the diversified duties necessary on work using such a varied assortment of equipment and situated so remote from industrial centers. The machine shops are located at Boot Key Harbor but a short distance from Marathon where all the repairs to plant and equipment are made.

The men are furnished board and lodging by the railway and care is taken to see that they are comfortably housed and well fed. Sanitation is carefully looked after and hospitals are maintained at Miami and Key West for cases that cannot be cared

for in camp. That the care taken produces results is evidenced from the fact that the sick rate, including accidents, averages from 1 to 1½ per cent. of the force. One thing that contributes largely to the health of the men is the lack of local water supply with its likelihood of pollution.

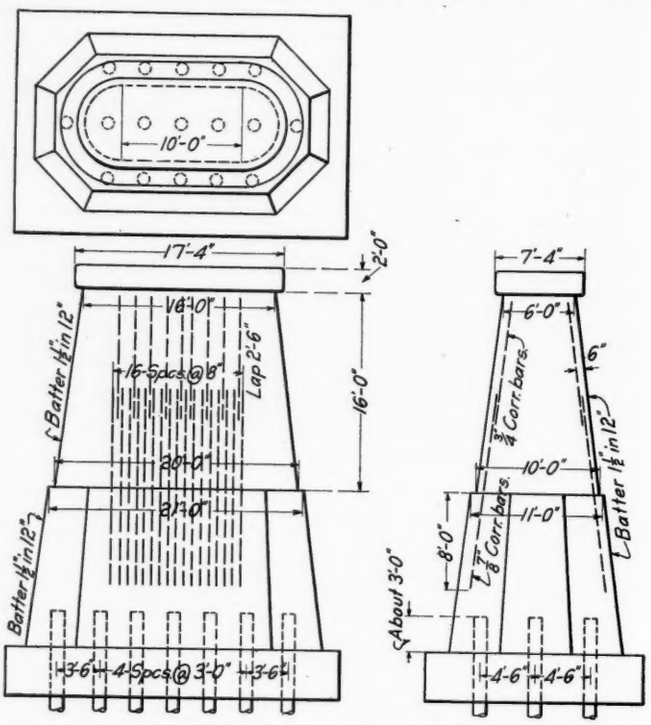
Owing to the situation of the work comparatively little trouble has been experienced with drunkenness except in the camps easily accessible to Key West. "Bum boats" occasionally come among the keys with their contraband cargoes, but have to operate so stealthily that little trouble is caused.

EQUIPMENT.

The equipment has been ample and well adapted for the work and comprises all that one would expect to find on construction of this character. One of the most efficient machines has been the gasoline excavator to which passing reference has been made. This device was evolved for this work and consists of a 30 h. p. Otto gasoline engine operating a boom and Hayward orange peel bucket of ¾ to 1¼ cu. yd. capacity. This has proved most economical, both in upkeep and in the saving effected in coal and water, both of which items are expensive owing to the cost of hauling and handling. Before the railway was completed to Key West the cost of water to the company at the latter place was ½ cent per gallon. The excavators are used either on land or water, being mounted on scows in such manner that they may be readily removed. Another efficient device is a steam drilling scow for putting in blast holes, the drills being driven in leads similar to a steam hammer pile driver. For driving piles from the track locomotive cranes, fitted with removable leads and Arnott steam hammers, have been used extensively, and for many classes of work are preferred to the regular track drivers.

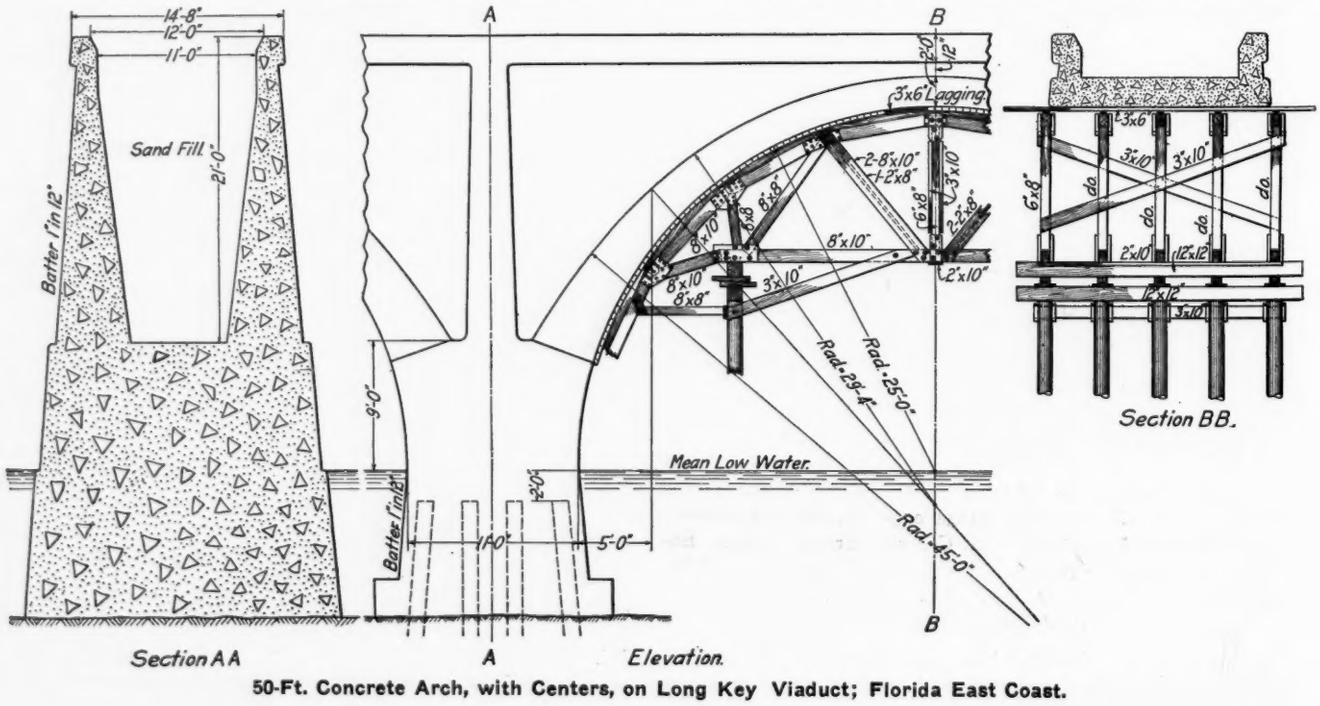
From an operating standpoint the extension is in surprisingly good physical condition when one stops to consider that in February, 1911, orders were given to have the line ready for traffic into Key West in January, 1912, instead of a year later, as had been the intention. The track is laid with 70 lb. rail, well tied, with tie plates on all curves. The grade is practically level at a minimum elevation of about 10 ft. above sea level except at Long Key, Knight's Key and Bahia Honda bridges where it is at a 30 ft. elevation. At present the approach grades at these places are one per cent., but this will be reduced to 0.3 per cent. On the bridges referred to speed is restricted to 15 miles per hour, to minimize the danger of derailment. In addition to this the despatcher's office is kept fully informed as to storm warnings and no train is allowed to proceed to exposed places when a hurricane is impending. Fortunately, severe storms are unusual except during the hurricane season.

Train service as scheduled provides two passenger trains and three freight trains each way daily except Sunday. One of the passenger trains is the "Oversea Limited," a solid Pullman train



Piers of Knight's Key Viaduct.

running between New York and Key West during the tourist season, and the other is a local from Jacksonville. The freight trains consist of one through freight, one way freight and one water train, the water for the entire extension being hauled from Everglade on the main land where a pumping plant and storage tanks are maintained. The water is hauled in cypress tanks of 3,000 gal. capacity erected on flat cars, each car holding



50-Ft. Concrete Arch, with Centers, on Long Key Viaduct; Florida East Coast.

two tanks. These cars are set out at water stations and construction camps as needed. The water is the surface water of the Everglades and is remarkably pure and soft, having but a small amount of lime.

"WILL IT PAY?"

The question has been asked, "Will it pay?" and the reply, whatever it may be is sure to start a discussion. Mr. Flagler thinks it will, backing his judgment with plenty of money, and his judgment in business matters in the past has shown itself to be sound. If there is any advantage in having a railway terminus insuring the shortest haul by vessel the Florida East Coast has that advantage, for business with the West Indies, Central America, the Panama canal and South America, and especially with Cuba, in the possibilities of through car shipments. Local traffic on the extension is small at present, but there are possibilities of increase, as the upper keys are well adapted for growing citrus fruits and afford excellent facilities during the winter months for yachting and fishing.

If in the foregoing Mr. Flagler and the railway company have been used synonymously it has not been through inadvertence nor for sentimental reasons. The railway has an authorized capital of $5,000,000 of which Mr. Flagler is the sole owner of the $3,000,000 outstanding stock and has agreed to purchase the remaining $2,000,000 for the purpose of completing the road to Key West. There have been issued $10,000,000 of 4½ per cent. first mortgage bonds, out of an authorized total of $12,000,000, and $20,000,000 of general mortgage income bonds, out of an authorized total of $25,000,000. The latter bonds are entitled to interest up to 5 per cent. from earnings after operating expenses, taxes and interest on the first mortgage bonds have been deducted. In the year 1910 the interest paid on this issue was 3½ per cent.

Comparative statements of earnings and expenses for the fiscal years ending June 30, 1903, 1905 and 1910 follow, together with analysis of the statement for 1910:

COMPARATIVE STATEMENTS, FISCAL YEARS ENDING JUNE 30, 1903, 1905 AND 1910.

Year.	Capital Stock.	Bonded Debt.	Value of Road and Property.	Road Operated. Miles.	Gross Earnings.	Net Earnings.	Net Income.	Interest Charges.	Total Deductions.	Balance. +Surplus. —Deficit.
1903	$1,000,000	$13,259,000	$13,656,737	484.95	$2,018,207	$666,614	$666,614	$523,777	$594,899	+$71,715
1905	1,000,000	13,259,000	14,552,134	500.84	2,328,864	720,334	722,674	669,200	743,605	—20,931
1910	3,000,000	30,000,000	31,176,122	583.47	3,687,434	1,481,621	1,490,213	1,150,000	1,376,288	+113,925

ANALYSIS OF EARNINGS AND EXPENSES, FISCAL YEAR ENDING JUNE 30, 1910.

Gross Earnings.		*Operating Expenses.*	
Passenger	$1,276,051	Maintenance of way and structures	$447,731
Freight	1,910,295	Maintenance of equipment	484,239
Mail	101,351	Transportation expenses	1,108,771
Express	260,107	Traffic expenses	64,995
Miscellaneous	139,630	General expenses	100,077
	$3,687,434		$2,205,813

With the opening of the Key West Extension the railway has 628 miles of main track in operation, as follows:

Jacksonville to Key West	522
Jacksonville to Mayport	26
East Palatka to Palatka	3
San Mateo Jct. to San Mateo	3
New Smyrna to Orange City	27
Titusville to Sanford	47
	628

In addition to the foregoing 160 miles is under construction from Maytown to Lake Okeechobee.

The work was begun under charge of J. C. Meredith as constructing engineer and W. J. Krome as principal assistant. In April, 1909, Mr. Meredith died from illness contracted on the work and was succeeded by Mr. Krome who has been in charge ever since. R. W. Carter is bridge engineer, and the division engineers are P. L. Wilson, C. S. Coe and Ernest Cotton. Edward Sheeran is general foreman in charge of equipment and the employment of labor. The writer is indebted to the railway company, and especially to Mr. Krome and Mr. Cotton, for information and for courtesies extended in making examinations of the work.

BLOCK SIGNAL MILEAGE, JANUARY 1.

The Interstate Commerce Commission has issued its bulletin showing the mileage of railways in the United States worked by the block system on January 1, 1912. The principal table in this bulletin, table 1, is reproduced herewith; also table 2, showing the kinds of automatic block signals in use.

The total length of road operated under the block system on January 1, 1912, was 76,409.7 miles; 20,334.9 miles automatic and 56,074.8 miles manual. There was an increase of 2,623.4 miles automatic and 2,517.2 miles manual, a total increase in miles operated under the block system during the year of 5,140.6 miles.

The present bulletin includes the following roads which have not heretofore reported the use of the block system: Arizona & New Mexico; Carolina & Northwestern; Chicago, Terre Haute & Southeastern; Copper Range; Denver & Rio Grande; Lake Erie & Pittsburg (N. Y. C. freight railway); New York, Chicago & St. Louis, and New York, Philadelphia & Norfolk.

Five instances are noted where two companies operate their two single track lines jointly as a double track, and in the table these pieces of road are credited as double track to both companies.

From table 3, showing methods and apparatus used with the manual block system, it appears that the Seaboard Air Line, on 206 miles, now uses the telegraph in block signaling where, according to last year's report, the telephone was used. A number of roads have increased the use of the telephone for blocking, notably the Cleveland, Cincinnati, Chicago & St. Louis, which now reports 922 miles of road on which the blocking is done by telephone. The telegraph has been entirely abandoned for block signaling on that company's lines. The total length of road in the United States on which the telephone is used for blocking is now reported as 16,544 miles, as compared with 12,199 miles one year previous.

From information heretofore given in the *Railway Age Gazette*, it appears that in the case of two roads, the Chicago Great Western and the Northwestern Pacific, the apparent decrease shown below is explained by the fact that figures published one year ago were erroneous. The block system was never used on the sections of line referred to. The Grand Trunk now reappears in the tables. This road reported the manual block system as in use several years ago, but the report was sent in under a misapprehension of the meaning of the term block system. It appears that now the space interval is actually used, but only for passenger trains. The Louisville & Nashville has discontinued the use of the block system on certain sections.

The use of alternating currents in track circuits for automatic signals is now reported by a dozen roads, the aggregate length of track being 898 miles. Most of the track thus reported is on lines where electric motors are used.

Upper quadrant semaphores are now in use on over 2,000 miles of road, the most prominent roads reporting these being the Baltimore & Ohio, Chicago, Milwaukee & St. Paul, New York Central, Norfolk & Western and Northern Pacific. This list contains 25 companies altogether.

The bulletin includes the usual table, showing the length of

TABLE 1—RAILWAYS WORKED BY THE BLOCK SYSTEM, JANUARY 1, 1912. (SEE NOTES ON NEXT PAGE.)

Names of railroads.	Automatic block signals.						Nonautomatic block signals.						Total automatic and nonautomatic.		Total passenger lines operated.		Percentage block signaled, miles of track.
	Single track.	Double track.	Three track.	Four track.	Total. Miles of road.	Total. Miles of track.	Single track.	Double track.	Three track.	Four track.	Total. Miles of road.	Total. Miles of track.	Miles of road.	Miles of track.	Miles of road.	Miles of track.	
Ann Arbor							1.0				1.0	1.0	1.0	1.0	292.0	292.0	0.3
Arizona and New Mexico	1.0				1.0	1.0							1.0	1.0	109.0	109.0	.9
Atchison, Topeka & Santa Fe:																	
Eastern lines	7.7	111.9			119.6	231.5	444.2	508.2			952.4	1,460.6	1,072.0	1,692.1	2,455.4	3,052.9	53.9
Western lines	3.8	2.5			6.3	8.8	541.7	23.8			565.5	589.3	571.8	598.1	2,856.2	2,882.4	20.7
Coast lines	9.0	22.2			31.2	53.4	4.3				4.3	4.3	35.5	57.7	1,878.5	1,985.2	2.9
Gulf, Colorado & Santa Fe	2.9				2.9	2.9	2.2				2.2	2.2	5.1	5.1	1,621.4	1,621.4	.3
Atlanta & West Point								6.0			6.0	12.0	6.0	12.0	86.0	92.0	13.0
Atlantic Coast Line	2.4	14.1			16.5	30.6	359.7	81.5			441.2	522.7	457.7	553.3	3,820.8	3,958.3	14.0
Auburn & Northern	6.5				6.5	6.5							6.5	6.5	6.5	6.5	100.0
Baltimore & Ohio	1.9	253.1		12.7	267.7	558.9	2,044.0	702.5	117.9	9.5	2,873.9	3,840.7	3,141.6	4,399.6	3,139.0	4,289.6	100.0
Baltimore & Ohio Chicago Terminal	1.2	11.2			12.4	23.0							12.4	23.0	45.8	73.0	31.5
Baltimore & Ohio Southwestern		24.8			24.8	49.6	910.6	44.7			955.3	1,000.0	980.1	1,049.6	980.1	1,049.6	100.0
Baltimore & Sparrow Point							1.7	3.0			4.7	7.7	4.7	7.7	4.7	7.7	100.0
Bessemer & Lake Erie							63.8	130.6			194.4	325.0	194.4	325.0	191.0	321.5	97.2
Boston & Maine	348.9	591.2		2.1	942.2	1,539.7							942.2	1,539.7	2,238.6	2,801.6	54.9
Boston, Revere Beach & Lynn		13.8			13.8	27.6							13.8	27.6	13.8	27.6	100.0
Buffalo, Rochester & Pittsburgh		35.1			35.1	70.2	295.1	96.5			391.6	488.0	426.7	558.2	426.7	558.2	100.0
Butte, Anaconda & Pacific	7.9				7.9	7.9							7.9	7.9	25.3	25.3	31.2
Carolina & Northwestern							6.1				6.1	6.1	6.1	6.1	133.5	133.5	4.5
Central New England	12.9	15.7			28.6	44.3	6.7				6.7	6.7	35.3	51.0	276.8	302.2	16.9
Central of Georgia							52.3	7.4			59.7	59.7	59.7	59.7	1,915.9	1,915.9	3.1
Central of New Jersey	13.0	165.5	2.4	31.5	212.4	477.2							212.4	477.2	464.1	742.9	64.2
Chesapeake & Ohio		409.0			409.0	818.0	1,086.2	59.5			1,145.7	1,203.2	1,554.7	2,023.2	1,602.8	2,070.7	97.7
Chesapeake & Ohio Ry. of Indiana							262.2				262.2	262.2	262.2	262.2	262.2	262.2	100.0
Chicago & Alton	420.7	184.6			605.3	789.9	141.2				141.2	141.2	746.5	931.1	1,025.2	1,209.8	72.8
Chicago & Eastern Illinois		98.4			98.4	196.8	277.0	55.2			332.2	387.4	430.6	584.2	972.7	1,131.2	51.6
Chicago & North Western		722.1	12.8	8.4	743.3	1,516.6	2,413.3	115.3			2,528.6	2,643.9	3,271.9	4,160.5	6,979.8	7,897.3	52.8
Milwaukee, Sparta & North Western							139.9	6.3			146.2	152.5	146.2	152.5	154.3	168.7	90.4
Chicago & Western Indiana		19.5			19.5	39.0		4.6	3.2		7.8	18.8	27.3	57.8	27.3	57.8	100.0
Chicago, Burlington & Quincy	44.6	43.6	1.6	5.4	95.2	158.2	7,922.6	642.5	17.1		8,582.2	9,258.9	8,677.4	9,417.1	8,422.2	9,171.1	100.0
Chicago Great Western	197.0	86.2			283.2	369.4	88.6				88.6	88.6	371.8	458.0	1,470.7	1,566.7	29.2
Chicago, Indianapolis & Louisville	26.2				26.2	26.2	498.7				498.7	498.7	524.9	524.9	578.0	578.0	90.9
Chicago, Milwaukee & St. Paul	5.9	103.7			109.6	213.3	3,300.5	478.4			3,778.9	4,257.3	3,888.5	4,470.6	6,048.1	6,628.1	67.5
Chicago, Milwaukee & Puget Sound	248.2				248.2	248.2	1,640.0				1,640.0	1,640.0	1,888.2	1,888.2	1,943.1	1,943.1	97.2
Tacoma & Eastern							129.0				129.0	129.0	129.0	129.0	129.0	129.0	100.0
Chicago, Peoria & St. Louis Ry. of Ill	1.3				1.3	1.3							1.3	1.3	237.0	237.0	.5
Chicago, Rock Island & Pacific	653.3	283.1			936.4	1,219.5	997.7				997.7	997.7	1,934.1	2,217.2	6,682.7	6,974.4	31.8
Chicago, Rock Island & Gulf	32.6				32.6	32.6							32.6	32.6	468.9	468.9	6.9
Chicago, St. Paul, Minneapolis & Omaha		6.2			6.2	12.4	549.6	104.5			654.1	758.5	660.3	770.9	1,527.1	1,645.5	46.9
Chicago, Terre Haute & Southeastern	1.5				1.5	1.5							1.5	1.5	351.1	367.6	.4
Cincinnati, Hamilton & Dayton	19.2	17.1			36.3	53.4	16.0	17.9			33.9	51.8	70.2	105.2	527.9	579.5	18.6
Cincinnati, Indianapolis & Western							99.0				99.0	99.0	99.0	99.0	360.9	360.9	27.4
Colorado Midland							2.0				2.0	2.0	2.0	2.0	261.1	261.1	.8
Copper Range							74.6				74.6	74.6	74.6	74.6	81.6	81.6	91.4
Cornwall & Lebanon							8.3	13.7			22.0	35.7	22.0	35.7	22.0	35.7	100.0
Cumberland & Pennsylvania							4.3		3.0		7.3	13.3	7.3	13.3	31.3	34.8	38.2
Cumberland Valley	4.9	38.5			43.4	81.9	11.1				11.1	11.1	54.5	93.0	162.2	206.9	44.9
Delaware & Hudson	164.7	225.9	4.3	17.5	412.4	699.5							412.4	699.5	743.9	1,042.4	55.4
Delaware, Lackawanna & Western	164.3	458.1	44.6	7.9	674.9	1,245.7	9.7				9.7	9.7	684.6	1,255.4	985.3	1,573.7	79.8
Denver and Rio Grande							7.7				7.7	7.7	7.7	7.7	2,247.3	2,406.7	.3
Duluth & Iron Range		16.1			16.1	17.9							16.1	17.9	200.5	270.6	6.6
Durham & Southern							56.0				56.0	56.0	56.0	56.0	56.0	56.0	100.0
Elgin, Joliet & Eastern	2.0	3.0			5.0	8.0	11.3				11.3	11.3	16.3	19.3	218.7	278.5	7.0
Erie		213.3		14.8	228.1	485.8	521.0	551.7			1,072.7	1,624.4	1,300.8	2,110.2	1,704.4	2,513.8	84.3
Chicago & Erie							240.4	8.4			248.8	257.2	248.8	257.2	248.8	257.2	100.0
Columbus & Erie							12.6	9.8			22.4	32.2	22.4	32.2	22.4	32.2	100.0
Erie & Jersey		42.3			42.3	84.6							42.3	84.6	Freight line		
Genesee River							32.6				32.6	32.6	32.6	32.6	32.6	32.6	100.0
New Jersey & New York		10.5			10.5	21.0	26.1				26.1	26.1	36.6	47.1	51.8	61.3	76.8
New York, Susquehanna & Western							16.0	13.7			29.7	43.4	29.7	43.4	203.4	217.1	20.0
Evansville & Terra Haute							105.8				105.8	105.8	105.8	105.8	143.3	143.3	73.8
Grand Trunk	1.1	1.6			2.7	4.3	807.6	323.5			1,131.1	1,454.6	1,133.8	1,458.9	1,133.8	1,458.9	100.0
Great Northern	9.9	162.0			171.9	333.9	77.8				77.8	77.8	249.7	411.7	7,088.8	7,290.0	5.6
Hocking Valley							138.4				138.4	138.4	138.4	138.4	338.0	338.0	36.2
Hudson & Manhattan	3.0	7.9			10.9	18.8							10.9	18.8	10.9	18.8	100.0
Illinois Central	65.1	235.1		12.0	312.2	621.0	7.0	5.0			12.0	17.0	324.2	638.0	4,462.7	5,027.2	12.7
Yazoo & Mississippi Valley	6.6				6.6	6.6		6.3			6.3	12.6	12.9	19.2	1,193.0	1,200.7	1.6
Illinois Traction	76.0				76.0	76.0							76.0	76.0	418.8	419.8	18.1
Iowa Central							11.0				11.0	11.0	11.0	11.0	503.0	503.0	2.2
Kanawha & Michigan	1.8				1.8	1.8	2.3				2.3	2.3	4.1	4.1	163.9	163.9	.3
Kentucky & Indiana Bridge & R. R. Co.							4.8	5.8	0.5		11.1	17.9	11.1	17.9	11.1	17.9	100.0
Kentwood & Eastern							3.3				3.3	3.3	3.3	3.3	30.0	30.0	11.0
Lackawanna & Wyoming Valley							1.0	2.4			3.4	5.8	3.4	5.8	22.6	43.4	13.3
Lehigh & New England	.7				.7	.7							.7	.7	67.2	67.2	
Lehigh Valley	14.1	447.5	34.9	24.1	520.6	1,110.0	645.7	51.9			697.6	749.5	1,218.2	1,859.5	1,178.0	1,779.3	100.0
Long Island	4.0	106.1	3.3	8.8	122.2	261.3		22.7			22.7	45.4	144.9	306.7	391.9	549.5	55.8
Louisville & Nashville	21.1	18.0			39.1	57.1	170.8	65.5			236.3	301.8	275.4	358.9	4,232.2	4,402.9	8.2
Maine Central	419.9	57.6			477.5	535.1							477.5	535.1	1,130.1	1,187.7	45.1
Portland Terminal	3.1	11.5			14.6	26.1							14.6	26.1	22.1	32.7	79.8
Minneapolis, St. Paul & Sault Ste. Marie							2,444.8	4.4			2,449.2	2,453.6	2,449.2	2,453.6	3,429.2	3,433.6	71.5
Missouri, Kansas & Texas	8.4	.8			9.2	10.0	9.5				9.5	9.5	18.7	19.5	2,885.9	2,886.7	.7
Missouri Pacific	54.5	33.3			87.8	120.1	465.7	5.4			471.1	476.5	558.9	596.6	3,736.8	3,790.5	13.1
St. Louis, Iron Mountain & Southern	113.8	9.4			123.2	131.8	315.2	52.8			368.0	420.8	491.2	552.6	3,100.1	3,259.2	17.0
Mobile & Ohio		4.7			4.7	9.4	51.9				51.9	51.9	56.6	61.3	827.0	827.0	6.9
Monongahela	.5				.5	.5							.5	.5	66.7	66.7	.7
Munising, Marquette & Southeastern							3.7				3.7	3.7	3.7	3.7	145.5	145.5	2.5
Nashville, Chattanooga & St. Louis							92.8	11.8			104.6	116.4	104.6	116.4	1,230.1	1,241.9	9.3
Newburgh & South Shore							.1	5.2			5.3	10.5	5.3	10.5	Freight line		
New York & Long Branch		38.0			38.0	76.0							38.0	76.0	38.0	76.0	100.0
New York Central lines:																	
Boston & Albany		132.9	50.1	23.6	206.6	510.5		1.9			1.9	3.8	208.5	514.3	356.7	607.6	84.6
Chicago, Indiana & Southern		5.0			5.0	10.0	144.1	59.1			203.2	262.3	208.2	272.3	421.3	540.5	50.3
Cleveland, Cincinnati, Chicago & St. Louis	2.3				2.3	2.3	542.6	379.0			921.6	1,300.6	923.9	1,302.9	1,865.4	2,283.2	58.0
Lake Erie & Western							862.8	9.2			872.0	881.2	872.0	881.2	832.5	841.5	100.0
Lake Shore & Michigan Southern	8.5	181.1	113.4	234.4	537.4	1,646.6	961.8	85.9			1,047.7	1,132.8	1,585.1	2,779.4	1,452.9	2,587.7	100.0
Dunkirk, Allegheny Valley & Pittsburgh							90.5				90.5	90.5	90.5	90.5	90.5	90.5	100.0
Lake Erie & Pittsburgh							27.8				27.8	27.8	27.8	27.8	Freight line		
Lake Erie, Alliance & Wheeling							87.7				87.7	87.7	87.7	87.7	87.7	87.7	100.0
Michigan Central		271.9			271.9	543.8	901.0	19.3			920.3	939.6	1,192.2	1,483.4	1,192.2	1,483.4	100.0
New York Central & Hudson River	1.9	505.8		66.6	574.3	1,279.9	1,597.9	867.4	15.5		2,480.8	3,379.1	3,055.1	4,659.0	3,085.8	4,722.9	98.7
Peoria & Eastern							84.0	1.7			85.7	87.4	85.7	87.4	337.9	340.3	25.7
Pittsburgh & Lake Erie		102.4		49.3	151.7	402.0	2.7				2.7	2.7	154.4	404.7	166.2	418.1	96.8
New York, Chicago & St. Louis	15.4				15.4	15.4							15.4	15.4	523.0	523.0	2.9
New York, New Haven & Hartford	17.5	264.3		9.2	291.0	601.3	154.3	205.7		75.8	435.8	868.9	726.8	1,470.2	1,958.1	3,120.2	47.1

TABLE 1—CONTINUED.—RAILWAYS WORKED BY THE BLOCK SYSTEM.

Names of railroads.	Automatic block signals.						Nonautomatic block signals.						Total automatic and nonautomatic.		Total passenger lines operated.		Percentage block signaled, miles of track.
	Single track.	Double track.	Three track.	Four track.	Total. Miles of road.	Total. Miles of track.	Single track.	Double track.	Three track.	Four track.	Total. Miles of road.	Total. Miles of track.	Miles of road.	Miles of track.	Miles of road.	Miles of track.	
New York, Ontario & Western	36.0	132.5	.....	.....	168.5	301.0	.....	.....	.....	.....	.....	.....	168.5	301.0	492.8	626.2	48.1
New York, Philadelphia & Norfolk	.....	8.8	.....	.....	8.8	17.6	43.6	40.0	.....	.....	83.6	123.6	92.4	141.2	112.0	160.7	87.8
Norfolk & Western	70.7	376.2	.....	.....	446.9	823.1	1,217.6	7.1	.....	.....	1,224.7	1,231.8	1,671.6	2,054.9	1,695.0	2,081.5	98.6
Northern Pacific	101.5	338.6	.....	.....	440.1	778.7	781.6	137.0	.....	.....	918.6	1,055.6	1,358.7	1,834.3	5,307.9	5,868.9	31.3
Northwestern Pacific	13.4	12.4	.....	.....	25.8	38.2	.....	.....	.....	.....	.....	.....	25.8	38.2	383.2	395.9	9.8
Pennsylvania	.....	60.0	3.1	204.3	267.4	949.9	1,884.9	673.2	25.8	191.9	2,775.8	4,113.1	3,043.2	5,063.0	3,217.2	5,237.5	95.0
Cleveland, Akron & Cincinnati	.....	.....	.....	.....	.....	.....	137.7	17.5	.....	.....	155.2	172.7	155.2	172.7	325.8	343.3	50.3
Grand Rapids & Indiana	.....	.....	.....	.....	.....	.....	55.8	2.2	.....	.....	58.0	60.2	58.0	60.2	532.5	543.1	11.1
Northern Central	.....	.....	.....	.....	.....	.....	286.7	121.9	.....	18.8	427.4	605.7	427.4	605.7	435.0	616.9	98.2
Pennsylvania Co.	.....	442.7	21.2	52.7	516.6	1,159.8	398.6	173.1	4.0	1.6	577.3	763.2	1,093.9	1,923.0	1,314.8	2,164.0	89.0
Philadelphia, Baltimore & Washington	.....	15.5	.....	21.0	36.5	115.1	426.4	146.7	14.6	18.7	606.5	838.4	643.0	953.5	646.0	956.8	99.6
Pittsburgh, Cincinnati, Chicago & St. Louis	.....	10.2	.....	3.5	13.7	34.4	489.9	515.3	59.2	34.9	1,099.3	1,837.7	1,113.0	1,872.1	1,415.6	2,174.5	86.0
West Jersey & Sea Shore	.....	87.1	6.0	.....	93.1	192.2	48.9	31.8	.....	.....	80.7	112.5	173.8	304.7	318.2	455.6	66.9
Vandalia	.....	.....	.....	.....	.....	.....	300.9	60.9	.....	.....	361.8	422.7	361.8	422.7	797.1	868.2	48.7
Peoria & Pekin Union	.....	.....	.....	.....	.....	.....	.....	6.5	.....	.....	6.5	13.0	6.5	13.0	15.2	24.2	53.7
Pere Marquette	15.2	.....	.....	.....	15.2	15.2	39.0	.....	.....	.....	39.0	39.0	54.2	54.2	1,534.2	1,589.6	3.4
Philadelphia & Reading	14.5	326.7	38.9	22.6	402.7	875.0	143.2	96.2	.....	.....	239.4	335.6	642.1	1,210.6	870.0	1,461.9	81.2
Atlantic City	.....	86.8	.....	.....	86.8	173.6	35.9	.....	.....	.....	35.9	35.9	122.7	209.5	164.0	251.9	83.2
Gettysburg & Harrisburg	.....	.....	.....	.....	.....	.....	24.2	.....	.....	.....	24.2	24.2	24.2	24.2	31.0	31.0	78.1
Northeast Pennsylvania	2.8	2.0	.....	.....	4.8	6.8	1.6	.....	.....	.....	1.6	1.6	6.4	8.4	25.6	27.6	30.4
Perkiomen	.....	.....	.....	.....	.....	.....	38.2	.....	.....	.....	38.2	38.2	38.2	38.2	38.2	38.2	100.0
Philadelphia, Newton & New York	3.8	1.7	1.6	.....	7.1	12.0	.....	.....	.....	.....	.....	.....	7.1	12.0	21.7	26.6	45.1
Reading & Columbia	.....	.....	.....	.....	.....	.....	34.9	.....	.....	.....	34.9	34.9	34.9	34.9	53.3	53.3	65.5
Quincy, Omaha & Kansas City, and Iowa & St. Louis	.....	.....	.....	.....	.....	.....	307.7	.....	.....	.....	307.7	307.7	307.7	307.7	307.7	307.7	100.0
Queen & Crescent Route:																	
Alabama Great Southern	108.1	.4	.....	.....	108.5	108.9	.....	.....	.....	.....	.....	.....	108.5	108.9	290.5	297.6	37.5
Cincinnati, New Orleans & Texas Pacific	263.3	70.8	.....	.....	334.1	404.9	.7	.....	.....	.....	.7	.7	334.8	405.6	335.4	406.2	99.8
New Orleans & Northeastern	77.9	15.5	.....	.....	93.4	108.9	.....	.....	.....	.....	.....	.....	93.4	108.9	195.6	211.1	51.6
Richmond, Fredericksburg & Potomac	.....	.....	.....	.....	.....	.....	9.0	78.7	.....	.....	87.7	166.4	87.7	166.4	87.7	166.4	100.0
St. Joseph & Grand Island	.....	.....	.....	.....	.....	.....	.3	.....	.....	.....	.3	.3	.3	.3	251.6	251.6	.....
St. Louis & San Francisco	695.9	37.8	.....	.....	733.7	771.5	108.3	.....	.....	.....	108.3	108.3	842.0	879.8	4731.9	4806.5	18.3
Beaumont, Sour Lake & Western	.....	.....	.....	.....	.....	.....	84.3	.....	.....	.....	84.3	84.3	84.3	84.3	118.3	118.3	71.3
New Orleans, Texas & Mexico	.....	.....	.....	.....	.....	.....	158.7	.....	.....	.....	158.7	158.7	158.7	158.7	264.3	264.3	60.1
Orange & Northwestern	.....	.....	.....	.....	.....	.....	61.6	.....	.....	.....	61.6	61.6	61.6	61.6	61.6	61.6	100.0
St. Louis, Merchants Bridge Terminal	.....	5.9	.....	.....	5.9	11.8	.....	1.1	.....	.....	1.1	2.2	7.0	14.0	10.0	19.8	70.7
St. Louis Southwestern	.4	.....	.....	.....	.4	.4	.....	.....	.....	.....	.....	.....	.4	.4	649.2	649.2	.1
San Francisco, Oakland & San Jose Consolidated	.....	3.8	.....	.....	3.8	7.6	.....	.....	.....	.....	.....	.....	3.8	7.6	18.0	35.4	21.1
San Pedro, Los Angeles & Salt Lake	3.7	.....	.....	.....	3.7	3.7	.....	.....	.....	.....	.....	.....	3.7	3.7	963.7	963.7	.4
Seaboard Air Line	.....	.....	.....	.....	.....	.....	213.5	.....	.....	.....	213.5	213.5	213.5	213.5	2,820.5	2,820.5	7.5
Southern	.....	3.0	.....	.....	3.0	6.0	1,562.3	273.1	.....	.....	1,835.4	2,108.5	1,838.4	2,114.5	6,616.7	6,952.2	30.4
Southern Illinois & Missouri Bridge	.....	4.6	.....	.....	4.6	9.2	.....	.....	.....	.....	.....	.....	4.6	9.2	4.6	9.2	100.0
Southern Pacific Atlantic System:																	
Galveston, Harrisburg & San Antonio	279.1	.....	.....	.....	279.1	279.1	.....	.....	.....	.....	.....	.....	279.1	279.1	1,270.3	1,274.7	21.9
Louisiana Western	103.6	.....	.....	.....	103.6	103.6	.....	.....	.....	.....	.....	.....	103.6	103.6	140.5	140.5	73.8
Morgan's Louisiana & Texas	95.3	.....	.....	.....	95.3	95.3	.....	.....	.....	.....	.....	.....	95.3	95.3	292.6	332.8	28.6
Texas & New Orleans	109.8	.....	.....	.....	109.8	109.8	.....	.....	.....	.....	.....	.....	109.8	109.8	438.4	438.4	24.9
Southern Pacific, Pacific System	2,266.3	172.8	.....	2.5	2,441.6	2,621.9	87.0	11.0	.....	.....	98.0	109.0	2,539.6	2,730.9	6,497.9	6,731.9	42.0
Spokane, Portland & Seattle	.5	6.8	.....	.....	7.3	14.1	.....	.....	.....	.....	.....	.....	7.3	14.1	505.0	515.6	2.7
Staten Island Rapid Transit	.....	10.1	.....	.6	10.7	21.3	.....	.....	.....	.....	.....	.....	10.7	21.3	10.7	21.3	92.5
Staten Island	.....	1.8	.....	.....	1.8	3.6	2.5	8.4	.....	.....	10.9	19.3	12.7	22.9	12.7	22.9	100.0
Syracuse, Lake Shore & Northern	.....	6.5	.....	.....	6.5	13.0	.....	.....	.....	.....	.....	.....	6.5	13.0	33.0	44.5	27.6
Terminal R. R. Assn., of St. Louis	.....	6.0	.....	.....	6.0	12.0	.....	1.1	.....	.....	1.1	2.2	7.1	14.2	12.7	25.4	55.9
Tidewater Power Co.	.....	.....	.....	.....	.....	.....	6.2	.....	.....	.....	6.2	6.2	6.2	6.2	11.3	15.7	39.5
Toledo, Peoria & Western	.....	.....	.....	.....	.....	.....	.3	.....	.....	.....	.3	.3	.3	.3	220.0	220.0	.1
Toledo, St. Louis & Western	.....	.....	.....	.....	.....	.....	172.0	.....	.....	.....	172.0	172.0	172.0	172.0	450.0	450.0	38.2
Ulster & Delaware	24.4	.....	.....	.....	24.4	24.4	.....	.....	.....	.....	.....	.....	24.4	24.4	126.3	126.3	19.8
Union	.....	0.6	.....	.....	0.6	1.2	1.4	.....	.....	.....	1.4	1.4	2.0	2.6	7.4	14.8	24.3
Union Pacific	766.8	684.1	.....	1.7	1,452.6	2,139.8	11.4	.....	.....	.....	11.4	11.4	1,464.0	2,151.2	3,506.5	4,210.9	51.1
Oregon-Washington R. R. & Navigation Co.	424.9	13.6	.....	.....	438.5	452.1	1.3	.....	.....	.....	1.3	1.3	439.8	453.4	1,427.3	1,445.6	31.3
Oregon Short Line	541.2	36.0	.....	.....	577.2	613.2	.....	.....	.....	.....	.....	.....	577.2	613.2	1,457.6	1,497.6	41.0
Virginia & Kentucky	.....	.....	.....	.....	.....	.....	.6	.....	.....	.....	.6	.6	.6	.6	4.8	4.8	12.5
Virginian	.....	.....	.....	.....	.....	.....	17.3	.....	.....	.....	17.3	17.3	17.3	17.3	460.0	460.0	3.8
Wabash	.....	13.2	.....	.....	13.2	26.4	1,726.7	88.0	.....	.....	1,814.7	1,902.7	1,827.9	1,929.1	1,954.9	2,056.1	93.8
Wabash-Pittsburg Terminal	.....	4.1	.....	.....	4.1	8.2	.....	.....	.....	.....	.....	.....	4.1	8.2	59.8	63.9	12.8
Washington Southern	.....	4.1	.....	1.5	5.6	14.2	.....	26.6	.....	.....	26.6	53.2	32.2	67.4	32.2	67.4	100.0
Washington Terminal[1]	.....	1.1	.....	1.0	2.1	20.4	.....	.....	.....	.....	.....	.....	2.1	20.4	2.1	20.4	100.0
Washington Water Power Co.	29.0	.....	.....	.....	29.0	29.0	.....	.....	.....	.....	.....	.....	29.0	29.0	29.0	29.0	100.0
Western Pacific	11.2	.....	.....	.....	11.2	11.2	.....	.....	.....	.....	.....	.....	11.2	11.2	11.2	11.2	100.0
Total	9,314.0	9,843.0	338.2	839.7	20,334.9	33,425.4	47,067.8	8,395.0	260.8	351.2	56,074.8	66,072.2	76,409.7	99,497.6	176,844.7	201,686.3	.....

The figures for the Bessemer & Lake Erie include nine miles of road on which no passenger trains are run. On the Central New England there is a length of four miles, single track, equipped with automatic signals but also worked by the controlled manual system for the protection of opposing trains. The figures in the columns headed "four-track" include short sections having more than four tracks on the Chicago & North Western, Illinois Central, New York, New Haven & Hartford and Washington Terminal. On 480 miles of the lines of the Chicago, Burlington & Quincy only one engine is in regular service, but the block system is put in effect whenever more than one engine is used. On the Duluth & Iron Range there is a length of 14 miles, double track, which has automatic signals for one track but not for the other. The Hudson & Manhattan does not appear in Table 2 for the reason that all of its signals are "light signals." The figures shown for the Philadelphia & Reading include 16 miles of road, partly double track, used exclusively for freight service.

railway on which the telephone is used for the transmission of train orders. The total length of road thus reported is 58,584 miles, as compared with 41,717 miles one year ago. On a few lines both telegraph and telephone are in use, so that this increase of 6,867 miles in telephone mileage is offset by a decrease in telegraph mileage of only 5,811 miles.

The last preceding bulletin of the Interstate Commerce Commission, showing block signal mileage, was noticed in the *Railway Age Gazette*, April 21, 1911.

Comparing the present report with the report for January 1, 1911, the notable changes given in the small table herewith appear, the figures in each case representing miles of road.

Name of road.	Increase—Automatic.	Increase—Nonautomatic.	Decrease. Nonautomatic.
	Miles.	*Miles.*	*Miles.*
Atchison, Topeka & Santa Fe	40.3	102.8	.....
Atlantic Coast Line	.....	.....	33.6
Baltimore & Ohio	49.6	1,827.2	.....
Boston & Maine	245.1	.....	4.8
Buffalo, Rochester & Pittsburgh	35.1	.....	38.3
Central New England	28.6	.....	9.3
Chesapeake & Ohio	226.0	.....	254.4
Chicago & Alton	44.3	.....	.....

TABLE 2—KINDS OF AUTOMATIC BLOCK SIGNALS IN USE.

Names of railroads.	Exposed disk.		Inclosed disk.		Semaphores.						Normal clear.	Normal danger.	Total automatic signals.		
					Electropneumatic.		Electric motor.		Electrogas.				Miles of road.	Miles of track.	Number of block sections.
	Miles of road.	Miles of track.	Miles of road.	Miles of track.	Miles of road.	Miles of track.	Miles of road.	Miles of track.	Miles of road.	Miles of track.	Miles of track.	Miles of track.			
Arizona & New Mexico							1.0	1.0			1.0		1.0	1.0	1
Atchison, Topeka & Santa Fe:															
Eastern lines							119.6	231.5			231.5		119.6	231.5	168
Western lines							6.3	8.8			8.8		6.3	8.8	10
Coast lines			3.0	3.0			28.2	50.4			53.4		31.2	53.4	49
Gulf, Colorado & Santa Fe			2.9	2.9							2.9		2.9	2.9	5
Atlantic Coast Line							16.5	30.6			30.6		16.5	30.6	35
Auburn & Northern							6.5	6.5			6.5		6.5	6.5	3
Baltimore & Ohio					12.2	39.0	161.9	333.8	93.6	186.1		558.9	267.7	558.9	677
Baltimore & Ohio Chicago Terminal			1.0	2.0			11.4	21.0			23.0		12.4	23.0	35
Baltimore & Ohio Southwestern							24.8	49.6				49.6	24.8	49.6	72
Boston & Maine[1]			.8	1.6			927.7	1,510.7	8.9	17.8	1,510.7	19.4	937.4	1,530.1	1,956
Boston, Revere Beach & Lynn							13.8	27.6			27.6		13.8	27.6	59
Buffalo, Rochester & Pittsburgh							35.1	70.2			70.2		35.1	70.2	66
Butte, Anaconda & Pacific			7.9	7.9							7.9		7.9	7.9	7
Central New England							28.6	44.3			44.3		28.6	44.3	49
Central of New Jersey					29.7	116.0	163.3	323.2	19.4	38.0	439.2	38.0	212.4	477.2	736
Chesapeake & Ohio							409.0	818.0			818.0		409.0	818.0	570
Chicago & Alton							605.3	789.9			367.6	422.3	605.3	789.9	418
Chicago & Eastern Illinois[2]			8.7	13.8			98.4	196.8			210.6		107.1	210.6	165
Chicago & North Western			736.8	1,500.0			6.5	16.6			1,212.8	303.8	743.3	1,516.6	1,196
Chicago & Western Indiana					1.7	3.4	17.8	35.6			39.0		19.5	39.0	63
Chicago, Burlington & Quincy			23.0	46.0			72.2	112.2			112.2	46.0	95.2	158.2	57
Chicago Great Western							283.2	369.4			369.4		283.2	369.4	273
Chicago, Indianapolis & Louisville							26.2	26.2			26.2		26.2	26.2	15
Chicago, Milwaukee & St. Paul			2.4	2.4			103.7	207.4	3.5	3.5	197.4	15.9	109.6	213.3	254
Chicago, Milwaukee & Puget Sound							248.2	248.2			248.2		248.2	248.2	189
Chicago, Peoria & St. Louis Ry. of Ill							1.3	1.3			1.3		1.3	1.3	1
Chicago, Rock Island & Pacific			3.3	6.6			933.1	1,212.9			1,212.5	7.0	936.4	1,219.5	1,294
Chicago, Rock Island & Gulf							32.6	32.6			32.6		32.6	32.6	50
Chicago, St. Paul, Minneapolis & Omaha							6.2	12.4			12.4		6.2	12.4	6
Chicago, Terre Haute & Southeastern							1.5	1.5			1.5		1.5	1.5	1
Cincinnati, Hamilton & Dayton							36.3	53.4			53.4		36.3	53.4	59
Cumberland Valley							43.4	81.9			81.9		43.4	81.9	91
Delaware & Hudson			31.2	62.4			21.8	43.6	359.4	593.5		699.5	412.4	699.5	1,028
Delaware, Lackawanna & Western			27.5	55.0	2.0	8.0	645.4	1,182.7			1,245.7		674.9	1,245.7	1,698
Duluth & Iron Range							16.1	17.9			17.9		16.1	17.9	8
Elgin, Joliet & Eastern							5.0	8.0			8.0		5.0	8.0	5
Erie							228.1	485.8			292.2	193.6	228.1	485.8	579
Erie & Jersey							42.3	84.6			84.6		42.3	84.6	88
New Jersey & New York							10.5	21.0			21.0		10.5	21.0	22
Grand Trunk					2.7	4.3					4.3		2.7	4.3	3
Great Northern							171.9	333 9			331.7	2.2	171.9	333.9	291
Illinois Central			29.5	104.2			118.8	187.0	163.9	329.8	252.1	368.9	312.2	621.0	536
Yazoo & Mississippi Valley							6.6	6.6			6.6		6.6	6.6	8
Illinois Traction							76.0	76.0			76.0		76.0	76.0	50
Kanawha & Michigan			1.0	1.0			.8	.8			1.8		1.8	1.8	2
Lehigh & New England							.7	.7			.7		.7	.7	1
Lehigh Valley			207.9	474.3			297.2	604.7	15.5	31.0		1,110.0	520.6	1,110.0	1,091
Long Island							122.2	261.3			257.3	4.0	122.2	261.3	410
Louisville & Nashville[3]							39.1	57.1			57.1		39.1	57.1	86
Maine Central							477.5	535.1			535.1		477.5	535.1	563
Portland Terminal							14.6	26.1			26.1		14.6	26.1	36
Missouri, Kansas & Texas			.5	.5			8.7	9.5			10.0		9.2	10.0	14
Missouri Pacific							87.8	120.5			120.5		87.8	120.5	104
St. Louis, Iron Mountain & Southern							123.2	131.8			121.8		123.2	131.8	123
Mobile & Ohio							4.7	9.4			9.4		4.7	9.4	6
Monongahela							.5	.5			.5		.5	.5	1
New York & Long Branch							38.0	76.0			76.0		38.0	76.0	118
New York Central lines:															
Boston & Albany[4]	15.9	32.4					180.5	456.0	6.6	13.2	154.2	347.4	203.0	501.6	639
Chicago, Indiana & Southern							5.0	10.0			10.0		5.0	10.0	14
Cleveland, Cincinnati, Chicago & St. Louis							2.3	2.3			2.3		2.3	2.3	3
Lake Shore & Michigan Southern			5.3	5.3			355.1	972.4	177.0	668.9	977.7	668.9	537.4	1,646.6	1,672
Michigan Central[5]			57.4	114.8			197.2	394.4			509.2		254.6	509.2	335
New York Central & Hudson River[6]			8.8	17.6			555.6	1,238.7	8.0	16.0	345.1	927.2	572.4	1,272.3	1,636
Pittsburgh & Lake Erie							151.7	402.0			402.0		151.7	402.0	550
New York, Chicago & St. Louis							15.4	15.4			15.4		15.4	15.4	17
New York, New Haven & Hartford	177.1	338.3	64.7	129.4			49.2	133.6			601.3		291.0	601.3	632
New York, Ontario & Western			75.8	131.3			92.7	169.7			301.0		168.5	301.0	170
New York, Philadelphia & Norfolk							8.8	17.6			17.6		8.8	17.6	9
Norfolk & Western					.7	.7	446.2	822.4			822.4	.7	446.9	823.1	804
Northern Pacific			1.5	1.5			438.1	776.2	.5	1.0	778.7		440.1	778.7	662
Northwestern Pacific							25.8	38.2			38.2		25.8	38.2	70
Pennsylvania[7]			4.6	9.2	245.9	901.2	11.8	23.2			933.6		262.3	933.6	1,561
Pennsylvania Co							516.6	1,159.8			1,159.8		516.6	1,159.8	1,487
Philadelphia, Baltimore & Washington					36.5	115.1					115.1		36.5	115.1	169
Pittsburgh, Cincinnati, Chicago & St. Louis							13.7	34.4			34.4		13.7	34.4	84
West Jersey & Sea Shore					74.7	155.4	18.4	36.8			192.2		93.1	192.2	249
Pere Marquette			10.0	10.0			5.2	5.2			15.2		15.2	15.2	11
Philadelphia & Reading			386.0	846.8	1.5	4.4	1.9	4.1	13.3	19.7	1.6	873.4	402.7	875.0	1,004
Atlantic City			86.8	173.6								173.6	86.8	173.6	95
Northeast Pennsylvania			4.8	6.8								6.8	4.8	6.8	8
Philadelphia, Newtown & New York			7.1	12.0								12.0	7.1	12.0	17
Queen & Crescent Route:															
Alabama Great Southern	29.0	29.0	9.0	9.0			70.5	70.9			108.9		108.5	108.9	76
Cincinnati, New Orleans & Texas Pacific	21.5	21.5	44.8	44.8			262.3	329.6	5.5	9.0	367.7	37.2	334.1	404.9	339
New Orleans & Northeastern							93.4	108.9			108.9		93.4	108.9	89
St. Louis & San Francisco							733.7	771.5			771.5		733.7	771.5	218
St. Louis Merchants' Bridge Terminal							5.9	11.8			11.8		5.9	11.8	30
St. Louis Southwestern							.4	.4			.4		.4	.4	1
San Francisco, Oakland & San Jose Consolidated							3.8	7.6			7.6		3.8	7.6	75
San Pedro, Los Angeles & Salt Lake							3.7	3.7			3.7		3.7	3.7	3
Southern							3.0	6.0			6.0		3.0	6.0	9
Southern Illinois & Missouri Bridge							4.6	9.2			9.2		4.6	9.2	18
Southern Pacific—Atlantic System:															
Galveston, Harrisburg & San Antonio							279.1	279.1			279.1		279.1	279.1	204
Louisiana Western							103.6	103.6			103.6		103.6	103.6	73
Morgan's Louisiana & Texas							95.3	95.3			95.3		95.3	95.3	72
Texas & New Orleans							109.8	109.8			109.8		109.8	109.8	77
Southern Pacific—Pacific System					5.0	12.0	2,436.6	2,609.9			2,621.9		2,441.6	2,621.9	2,274
Spokane, Portland & Seattle							7.3	14.1			14.1		7.3	14.1	11
Staten Island Rapid Transit			10.7	21.3							21.3		10.7	21.3	55
Staten Island			1.8	3.6							3.6		1.8	3.6	6
Syracuse, Lake Shore & Northern							6.5	13.0			13.0		6.5	13.0	26
Terminal Railroad Association of St. Louis							6.0	12.0			12.0		6.0	12.0	16
Ulster & Delaware							24.4	24.4			24.4		24.4	24.4	20

TABLE 2—CONTINUED.

Names of railroads.	Exposed disk.		Inclosed disk.		Semaphores.						Normal clear.	Normal danger.	Total automatic signals.		
					Electropneumatic.		Electric motor.		Electrogas.						
	Miles of road.	Miles of track.	Miles of road.	Miles of track.	Miles of road.	Miles of track.	Miles of road.	Miles of track.	Miles of road.	Miles of track.	Miles of track.	Miles of track.	Miles of road.	Miles of track.	Number of block sections.
Union	.....	.....	.6	1.2	.....	.....	.....	.....	.....	.....	1.2	.....	.6	1.2	1
Union Pacific	.....	.....	8.8	15.1	.....	.....	1,412.9	2,062.9	30.9	61.8	2,139.8	.....	1,452.6	2,139.8	1,710
Oregon-Washington R. R. & Navigation Co.	.....	.....	.....	.....	.....	.....	438.5	452.1	.....	.....	452.1	.....	438.5	452.1	345
Oregon Short Line	.....	.....	1.7	1.7	.....	.....	575.5	611.5	.....	.....	613.2	.....	577.2	613.2	482
Wabash	.....	.....	.....	.....	.....	.....	13.2	26.4	.....	.....	26.4	.....	13.2	26.4	37
Wabash Pittsburgh Terminal	.....	.....	.....	.....	4.1	8.2	.....	.....	.....	.....	8.2	.....	4.1	8.2	11
Washington Southern	.....	.....	.....	.....	5.6	14.2	.....	.....	.....	.....	14.2	.....	5.6	14.2	12
Washington Terminal	.....	.....	.....	.....	2.1	20.4	.....	.....	.....	.....	.....	20.4	2.1	20.4	13
Washington Water Power Co.	.....	.....	.....	.....	.....	.....	29.0	29.0	.....	.....	29.0	.....	29.0	29.0	23
Western Pacific	.....	.....	.....	.....	.....	.....	11.2	11.2	.....	.....	11.2	.....	11.2	11.2	8
Total	243.5	421.2	1,877.6	3,838.6	424.4	1,402.3	16,848.5	25,692.4	906.0	1,989.3	26,437.1	6,906.7	20,300.0	33,343.8	33,715

[1] (Boston & Maine.) 4.8 miles double track light signals in the Hoosac tunnel not shown in this table. Provision is made for the operation of the road through this tunnel as single track, at which time the staff system is used.
[2] (Chicago & Eastern Illinois.) The figures in this table include 8.7 miles of inclosed disk signals used in manual block territory which are not shown in Table 1.
[3] (Louisville & Nashville.) Automatic signals are installed on 22.3 miles single track in manual block territory.
[4] (Boston & Albany.) 3.6 miles of road, 8.9 miles of track, on which slotted signals are used, not shown in this table.
[5] (Michigan Central.) 17.3 miles double track slotted and semiautomatic signals not shown in this table.
[6] (New York Central & Hudson River.) 1.9 miles four-track light signals not shown in this table.
[7] (Pennsylvania.) 5.1 miles road, 16.3 miles track, light signals, not shown in this table.

Name of road.	Increase—Automatic.	Increase—Nonautomatic.	Decrease. Nonautomatic.
	Miles.	*Miles.*	*Miles.*
Chicago & Eastern Illinois	.....	100.8	.....
Chicago, Burlington & Quincy	52.8	.....	109.8
Chicago Great Western	177.3	.....	1,242.3
Chicago, Indianapolis & Louisville	26.2	.....	26.3
Chicago, Milwaukee & Puget Sound	248.2	275.3	.....
Cumberland Valley	36.7	.....	8.5
Delaware, Lackawanna & Western	90.2	.....	.....
Grand Trunk	.....	1,131.1	.....
Great Northern	41.1	.....	180.7
Illinois Traction	76.0	.....	24.0
Louisville & Nashville	.....	.....	259.6
Missouri Pacific	6.9	452.5	.....
St. Louis, Iron Mountain & So.	.....	355.3	.....
New York Central & Hudson River	192.8	.....	.....
Norfolk & Western	106.1	.....	86.7
Northern Pacific	201.9	.....	74.9
Northwestern Pacific	11.9	.....	250.5
Pennsylvania	4.5	414.3	.....
Pennsylvania Co.	172.3	.....	171.8
Philadelphia, Baltimore & W.	.....	272.6	.....
Queen & Crescent—New Orleans & N. E.	77.9	.....	.....
St. Louis & San Francisco	133.6	.....	49.0
Southern Pacific—Pacific System	86.5	.....	.....
Union Pacific	38.9	.....	.....

It will be noticed that the increase in block signal mileage during the year 1911, as shown in the present report, is considerably larger than that shown in the *Railway Age Gazette* of December 29, 1911, a number of roads from which statements were then unobtainable having made large increases during the year.

The Belgian government has made an arrangement with the Societe Generale de Belgique, Brussels, for the construction of a new railway in the Belgian Congo, which will connect the Casait and Katanga districts. For the construction of this railway a company will be formed with $7,500,000 capital.

The concession for building the Amazon-Pacific, or Ucayali railway, Peru, as modified by the Peruvian congress, was signed by President Leguia on March 8. The modifications of the original contract of April 11, 1907, are as follows: The gage is reduced, at the option of the concessionaires, from 4 ft. 6 in. to 3 ft. 3 in., but the tunnels and cuts are to be made as for a normal gage. The concessionaires may prefer to build a broad-gage road. A grade up to 5 per cent. is authorized for the section of the road between Goyllarisquisca and the exit of the pass of Tusi. The Ucayali railway should be completed at least by the time the Panama canal is officially opened, and will enable direct shipment of United States products to be made to the Amazon regions via the Panama canal, the Pacific ocean, and the port of Callao, thus materially increasing the commercial importance of this port, which will then be the Pacific terminus of this transcontinental route.

GOVERNMENT RAILWAY OPERATION IN FRANCE-*

BY PAUL LEROY-BEAULIEU.

The French government has owned and operated a system of railways, its own property, for about 35 years. This system had a limited extent at first, but gradually it was carried to 2,992 kilometers (about 1,860 miles). The management of it was very ordinary; it certainly had no pretention to being a "model system," or an experimental system, as was promised. It went on indifferently, with accidents relatively frequent—there being several sensational ones. It was almost unproductive, leaving only net earnings of 12,000,000, or a maximum of 15,000,000 francs, which were out of all proportion to the purchase price or the value of the property.

It was argued, as excuse, that this system was badly placed between systems vaster and better situated. The government wished to do something grander. In 1908 it obtained from parliament—by several majority votes in the senate, and against the opinion of all the financiers of that assembly, notably those of several ex-ministers of finance—authority for the purchase of the neighboring and much larger system, the Western Railway. To force the vote of the senatorial assembly, which opposed this action, M. Clemenceau found it necessary to declare that if they did not pass it (in order to realize this great "reform") he would resign. What a pity they did not let him resign, more especially as several months later an unexpected vote of the Chamber of Deputies, upon an incident of the assembly, forced him to resign.

M. Clemenceau, chief of the cabinet; M. Caillaux, then minister of finance; M. Barthou, then minister of public works, followed each other in the speaker's chair, in order to affirm that the purchase was very simple and could not in any case be onerous to the state. The most positive, the most solemn, the most precise declarations were made on this subject by the three ministers. As to the service of the system, it would be considerably improved; the people of the western provinces would experience benefits from the state management.

The government, by this threat of resignation—which, however, would have been an event, or, rather, an incident, of very little significance—carried the day. The purchase was voted. The system of the Western Company, comprising today 5,960 kilometers (about 3,700 miles) passed into the hands of the state, making a total of 8,952 kilometers (about 5,600 miles)

*A translation of an article in *The Economiste* of Paris, December 2, 1911. M. Leroy-Beaulieu has long been one of the leading economists of France.

of railways belonging to the French government, about 600 kilometers less than the system of the Paris-Lyons-Mediterranean Company, and more than any of the systems of the four other great companies.

Three years have passed since then. The last year of operation by the company was the year 1908. Every one knows the deplorable effects of the government operation. It has been complete disorder for three years, which grows instead of lessening—the most frequent irregularities in the arrival and departure of trains; the most constant errors and phenomenal delays in the transportation and delivery of freight. The people, given poor service by the government in cases where they had no recourse to water transportation as a substitute or subsidiary, are perforce obliged to revive the old modes of transportation by wagon. In brief, at the end of three years the operation by the government appears as a public calamity and a financial disaster. Besides, sensational accidents succeed each other, not only on the Western State system, but upon the old state system, the latter of which has been operated for nearly 35 years.

Let us state first the financial disaster. It ought to cost the state nothing more, Messieurs Clemenceau, Caillaux and Barthou assured us in their speeches to the senate, after the purchase, than before. But we have prepared a comparative statement of the receipts and expenses of the system of the Western State before and after the purchase. It is edifying. We give it below:

Years.	Gross receipts in francs.	Expenditures in francs.	Net receipts in francs.
1908 (last year of the operation by the company).....	218,378,000	146,801,000	71,577,000
1909 (operated by state).....	219,341,000	152,782,000	66,561,000
1910 (operated by state).....	229,621,000	174,441,000	55,180,000
1911 (estimated)	233,014,000	203,545,300	29,468,700

Thus, though the gross receipts have advanced nearly 15 millions in that period, the expenses have increased nearly 57 millions, and the net receipts have fallen more than 42 millions. The Western system realized 71,500,000 francs net receipts during the last year of private operation. The first year of operation by the state, this figure was almost maintained, there being a loss of only 5 millions; the state had not had yet time to complicate and disorganize the service. The second year of state operation, the disorganization of service being accentuated, there was a new loss of almost eleven and a half millions in the net reecipts; and at last, in the third year of operation by the state, which year is approaching its end, the decline of net receipts, as we can foresee, will be much more considerable; it approaches 25 millions. Since the purchase the net receipts of this vast system of 5,960 kilometers have been diminished more than 42 millions, or about 60 per cent. The net receipts tend to vanish completely. It will not be astonishing if there remains nothing in two or three years from now. What has become of the promises of Messieurs Clemenceau, Caillaux and Barthou in the discussion upon the purchase? Whence come these frightful miscalculations? From the usual faults of federal administration in democratic countries—unstable personnel in high places; confirmed habits of prodigality, of favoritism; want of unanimity and want of discipline.

In order to quote only a few facts, they have increased enormously the office staff; doubled, indeed trebled, the number of employees; have created 3,000 places to reinforce the personnel of the stations, 900 for the train service, 380 for the track service, or an increase of effective force of 5,280 units; when the increase of traffic did not warrant more than a quarter, or a third at the most, of that increase. It has come to that point when the administration of the state railways does not know—parliamentary reports as witness—the importance of the actual working force of its staff. They have raised the larger part of the salaries, but there is still only a dissatisfied personnel. Unparalleled errors have been made in materials and work.

The financial results of the operation by the state of the system of the old company of the West, already so deplorable, according to the statement above, appear yet to be bound to increase. The budget of 1911 foresaw really for that operation a deficit of 41,847,000 francs. A demand of supplementary credits, recently disposed of and which will not perhaps be the last for that cause, added to it 32,286,000 francs. The total charge of the system for the state mounts up thus to 74,133,000 francs. But the old company of the West only demanded of the treasury as guarantee of interests those sums which, according to the annual report have varied in the recent period, between a minimum of 6,000,000 a year and a maximum of 27,000,000; this last figure attained only in the last year of operation, on account of divers charges of liquidation which without the purchase would have been divided among several accounts. In taking, nevertheless, as a term of comparison, this maximum figure of 27,000,000 of the guarantee of interest, which at the outside would not have been prolonged beyond the year 1934, one sees that the additional burden on the people, that is to say, the taxpayers, due to the purchase, attained 47,000,000 francs in 1911.

These are the financial results of the purchase of a property, which, according to the assertions of the three ministers, MM. Clemenceau, Caillaux and Barthou, would be self-supporting. "A clean transaction," they said complacently. If the people enjoyed a convenient service—we do not say improved, but not deteriorated—we would not complain. But one knows the frightful disorganization to which the service of this unhappy system is the victim. In the sessions of November 23 and 24 in the senate, the most formal and most certain declarations came from MM. Jenouvrier, d'Estournelles de Constant, Richard Waddington and Milliard painting "the deplorable condition of the Western State system." These are the very terms of the order of the day voted by the senate in the session of November 24.

The operation of the railways by the state, outside all its monstrous irregularities, its frequent accidents, has gone back 50 years as compared with the operation of the company. After the first period, when the state increased the number of trains and had quicker service on several of them, it resolved, on the contrary, to reduce the number and the speed. M. Waddington, for example, demonstrated that the duration of the journey from Rouen to Paris, which in the last year of operation by the company (1908) was 143 kilometers, for 2 hours and 11 minutes, is now 2 hours and 39 minutes, or 28 minutes more; which represents an increase of more than 20 per cent. in the time of the journey. It is even seven minutes longer in 1911 than in 1865; and then we were at the beginning of the operation of railways.

Yet the reduction in the number of trains and their decrease in speed are the least evil. We refer the reader who wishes to have precise details to the extraordinary revelations made by the different orators in the senate, MM. Jenouvrier, d'Estournelles de Constant, Waddington and Milliard. They fill entirely a series of columns in the official journal of November 24 and 25 last. We content ourselves by reproducing here a resolution of the chamber of commerce of Evreux, from which M. Milliard had read:

"The chamber of commerce of Evreux, noting that the management of the railway of the Western State is more than ever unable to assure the transport of freight to its destination on its lines; noting that this incapacity throws into the greatest disturbance the commercial relations of our region and threatens to cause the ruin of its industries; noting that this situation is the cause of numerous legal processes, and necessitates the payment of large indemnities by the Western State Railway which are met largely by the taxpayers; noting, lastly, that because of the extension of the evil and the dissatisfaction which results from a general discontent, there is cause to dread an agitation of a violent character, such as has been produced by other causes in years past, therefore, calls the most serious

attention of the competent ministers to the facts above noted and asks the promise that the condition will be remedied."

M. Milliard is senator from the Eure, and this is why he quotes the deliberation of the chamber of commerce of Evreux. His colleagues, representing the other departments of the system, could quote similar resolutions from the reports of the chamber of commerce of that region.

It is in vain that the government seeks to excuse its deplorable administration, by throwing the responsibility on the old company. The latter has not been in possession for three years, and under its management the operation of the Western system—if it was not particularly remarkable—was very decent; the trains were more numerous and faster than at present. There was not then the lamentable disorder of which the people complain at the present time. There was besides (the company has proved it) no grave accident upon its system. These accidents are multiplied today in a most distressing fashion; as much upon the Western State system as upon the old state system.

On that old system which the state has operated for nearly 35 years was that horrible accident of Montreuil-Bellay, by the failure of the bridge and the precipitation of a train into the Thouet river. Hardly four years ago there was, on that same old state system, a frightful accident of the same nature, within 60 kilometers of the same place on August 4, 1907, at the Ponts-de-Cé, causing the death of 30 passengers. Let us recall another accident, recent also, which happened suddenly, causing the death of 40 passengers; also, of course, on the old state system at Saujon, near Bordeaux, in August, 1910. Add to these on the Western State system the accident of Villepreux, June 18, 1910, where there were 18 deaths; then that of Bernay, September 10, 1910, with ten victims; and, still on the Western State, the accident of Courville, February 14, 1911, where there were ten deaths.

The six greatest accidents which have taken place in France during four years, those of Ponts-de-Cé, Villepreux, Saujon, Bernay, Courville and Montreuil-Bellay, have all happened on the state railways—three on the Western State and three on the old state system, which the state operated for nearly 35 years, and which is only 2,992 kilometers long, or about one-fifteen of the length of the systems under private management.

The French government owns different monopolies, those of tobacco, matches and powder. It has possessed itself of another monopoly for several years more or less, that of homicidal railway accidents. Six fatal accidents to passenger trains in four years, equally divided between the Western State and the old state system! And this deadly management imposes on the French tax-payers 50 million francs annual charges! Here is the great "reform!" Here the masterpiece! The senate closed its discussion on November 24 by an order of the day which it is well to reproduce:

"The senate sends the testimony of its profound sympathy to the families of the victims of the catastrophe of Montreuil-Bellay and its congratulations to the rescuers; taking account of the declarations of the minister of public works, of the efforts made to lighten the deplorable condition of the system of the Western State Railway System, and trusting to the government to put a stop to the insecurity as well as the irregularity of its administration."

Thus "the deplorable condition of the system, the insecurity and irregularity of the management" are solemnly stated by the senate. The system operated by the state represents among the French railways the drunken slave among the Greeks. How can one stop this plague? According to our opinion, there is only one remedy, and we hope that it will soon come: it is other management than that of the state system. Certain persons wish that this horribly costly experiment be prolonged. It is an abyss. The democratic government, inclined to demagogy, having a varying personnel, practicing favoritism, favoring want of discipline, and habituated to prodigality and want of unanimity, is incapable of conducting with method, surety and economy a complicated industrial work. We are having it fully demonstrated. No matter how well-advised and wise, the rules of the state administration cannot have the suppleness of those of private management. The same men in the service of the state cannot be as valuable as in the service of independent companies, because they are subjected to many more hindrances, much more suspicion, much more red tape and are especially restrained in their initiative.

Let the government rid itself of its purely industrial tasks. Let it concentrate its attention and its efforts on its own distinctive tasks—the general administration of the nation, the defense of the country, the army and navy, its foreign representation. When it will confine itself to these essential tasks, which no one else can do, perhaps it will accomplish them with less want of unanimity and inefficiency than it has done for a certain number of years.

The French government will have a survey made for the proposed railway from Tangier, Morocco, to Fez. It is probable that instead of a direct route, a route via Mekinez will be chosen, owing to its smaller cost, for, though it would be a good deal longer, this route would avoid the mountainous region and would partly coincide with the proposed line from Fez to Rabat.

The program of new works proposed by existing railway companies in the United Kingdom in bills and provisional orders in the present session of parliament contemplates a total expenditure of $20,011,242, exclusive of $867,502, for Edgware & Hampstead railway works authorized by previous acts and intended to be replaced by deviations and alterations at any extra cost of $642,052. Existing companies propose to construct a new railway 45 miles single and 20 miles double track. Double line widenings aggregate 29 miles, most important being the Great Central outside Sheffield and at various points between Mexboro and Barnetby, total 22 miles, estimated cost $2,400,381. Of 28 miles of single-line widening, 26 miles will be constructed at different points on the Great Eastern, estimated cost $661,557; and double-line deviations, alterations of levels, etc., 4 miles. By individual companies the largest expenditures will be made on electric railways in the London district. The London Electric contemplates spending $3,664,474, and the London & North Western $2,877,425. A new line to Watford and widenings between Finchley road and Wembley park will cost the Metropolitan $1,825,638. The Metropolitan District Company contemplates $1,190,175 expenditure on widenings between East Putney and Wimbledon, and the Great Western and Midland propose outlays of $1,942,488 and $1,697,941, respectively, in South Wales and other parts of their system. Existing companies propose to spend the following amounts: On 113 bridges over public roads, railways, rivers, or canals, $826,878; on accommodation works, $1,281,524; on viaducts, $64,934; on tunnels, $3,771,381; on retaining walls, $582,929; on covered way, $162,478; on electrical equipment, $42,275; and on stations, $1,109,635. On widening, lengthening or reconstruction of bridges, $326,639 is proposed to be spent by the Great Western, $53,531 by the Great Eastern, $4,818 by the Great Central, and $3,163 by the Caledonian. The Great Eastern proposed also to spend $73,172 on river walls and $13,845 on pier works; and new subways will cost the London Electric $205,366. Two railway proposals by new companies seeking incorporation are the Canvey Island Deepwater Wharf & Railway, with a proposed expenditure of $2,458,653, and the Lothian railways with $1,456,855. The Canvey Island expenditure includes $1,672,713 on the construction of a new wharf, and the remainder on constructing 4 miles of single line, involving $136,262 for a public road and railway bridge, $10,920 for culverts and drains, and $14,137 for stations. The 14 miles of single line of the Lothian railways is estimated to involve expenditures of $239,870 for 33 public road and railway bridges, $58,130 for accommodation works, $194,660 for viaducts, and $37,082 for culverts and drains.

DEFECTIVE BOX CARS AND DAMAGED FREIGHT.

Fifth Article. Examples of Best Wood and Steel Frame Equipment. Possibilities of All-Metal Construction. Conclusions.

The first four articles in this series directed attention to the great expense to which the railways are put because of damage to freight due to defective equipment. The various defects which are responsible for such damage have been considered in detail, and in all cases recommendations have been made, or devices have been described, which will largely overcome the difficulties. To make the series of articles doubly constructive it is proposed in this fifth article to describe certain box cars which, more than any others of their particular type of construction, seem to have given the best results from the standpoint of loss and damage to freight. These cars were not selected because of any theory or imagination on the part of the editor, but were recommended by practical men in the operating, motive power and car departments, because of the good results which they have given in service. One of them, a Santa Fe 40-ton car, has a wooden underframe and superstructure. Another, the Canadian Pacific car, has a steel underframe and a steel frame for the superstructure. In addition to these two cars another type—the all-steel box car—which at the present is almost entirely experimental, but which promises to give a good account of itself in the future, is considered.

WOODEN BOX CAR.

An all-wood box car which seems to have received more favorable attention generally from the car department and operating officers who are interested in reducing the amount of damage and loss to freight, than any of the other cars of that type, is the standard 40-ton box car of the Atchison, Topeka & Santa Fe, the general construction of which is shown in Fig. 56. Various details of this car have been touched upon in the earlier articles of this series and several of them have been illustrated.

The side door was described in the issue of April 19, page 892. A master car builder of no mean experience, in commenting on box car side doors, made the following statement: "There is not a railway in the United States or Canada that has in use a side door which answers the purpose. They are entirely too weak. They should be just as strong as any other part of the car, for when the load shifts or becomes disarranged it will always push out the weak part of the car, which is the side doors, and it is for this reason that we have so many trains side-wiped and so many lost doors." To secure a door of the strength indicated it may be necessary to make it entirely of steel—and such designs are now being developed. The door on the Santa Fe car is, of course, not nearly as strong as the side of the car, but if properly applied there should be very little danger of cinders or moisture entering the car at either the top, bottom or ends of the door. It is also burglar proof; that is, it cannot be forced open without leaving evidence of its having been broken into, thus saving the expense of a fruitless search in attempting to trace the goods under the impression that they have been mis-sent, and also making it possible to locate the approximate point at which the robbery occurred. The door is thus far in advance of the average side door now found on box cars. The door post is also reinforced, as shown on page 894 of the issue of April 19, thus making a more substantial construction and reducing the cost of maintenance of both the door post and the door.

Both the sides and the ends of the car are of substantial construction. It is true that the grain or V strip is nailed in place, as in the ordinary box car, but the loosening of this strip is not such a serious matter where wooden side sills are used as is the case with a steel underframe. However, the car could be improved in this respect by fastening these strips more securely.

The end construction is particularly good and was fully described in the issue of April 26, page 959. The end door, of steel construction, is also far more substantial and effective than is to be found on most box cars; it was illustrated on page 1003 of the May 3 issue. The roof is substantially supported on strong metal carlines, which are rigidly tied to the side plates. An outside metal roof is used, which is said to have given good results. The strong construction of the roof frame has undoubtedly favored the roof.

The Canadian Pacific has found it advisable to place a stronger end on its standard wooden box cars and the method of doing this is shown in Fig. 57. The end and corner posts are constructed of Z-bars, weighing 6.7 lbs. per foot; lining of 1¾ in. x 5 in. planks is placed inside of the end posts and is fitted into Z-bar corner posts, as shown on the drawing. A 3.5-lb. Z-bar is fitted between the bottom of the end plate and the top of the sheathing. The tops of the end posts are riveted to this Z-bar, while the bottoms are fastened to the 4 in. x 3 in. x ¼ in angle plate, which connects the end sill and the sheathing. The end sill is backed up and reinforced on the inside for a considerable part of its length by a 11.25 lb. channel. The end is, therefore, far more substantial and tight than the ordinary type of construction.

A method of reinforcing the ends of box cars on the Central of Georgia is illustrated in connection with a communication from F. F. Gaines, superintendent of motive power, in another part of this issue.

STEEL FRAME BOX CARS.

In designing steel frame box cars very little attempt seems to have been made to strike out along original lines and to adapt the design to secure the best results from the use of the steel. In most cases the wooden parts seem to have been simply replaced by steel ones, and the sheathing, floor, etc., are attached as nearly according to the practice followed with wooden construction as possible. Naturally this method does not give the best results and many defects have developed, as indicated in the third article of this series in our issue of April 26.

The steel frame box cars of the Canadian Pacific, of which there are now 4,500 in service and 4,500 building, are a notable exception to this method of construction, and the cars are undoubtedly more satisfactory, both from the standpoint of the loss and damage to the freight and from that of the cost of maintenance, than any of the other steel frame cars which have been introduced thus far. The general construction of these cars is shown in Figs. 58 to 61 inclusive. The steel framework is on the outside of the car, and the sheathing on the inside consists of 5½ in. x 1½ in. planks. The bolt holes through the frame members are slotted so that in case the sheathing should shrink, the bolts can be loosened and it can be wedged down from the top and tightened up. In the first cars that were built provision was made for drawing the sheathing down by tightening the nuts on long rods extending from the side plate to the side sill. It was found, however, that if the lumber was properly dried and the cars were erected according to instructions that there was no tendency for the wood to shrink, and some of these cars which have been in service for two years are still as tight as when they were first built.

Kiln dried lumber was not used on some of the first cars of this type, but the lumber apparently shrunk as much in the first two or three months as it will ever shrink, and one tightening down of the side planks is probably all that will ever be required. The planks are tongued and grooved, and the joints are painted when the cars are erected.

The strongest criticism which can be directed against the car is that the car builders in this country do not have sufficient

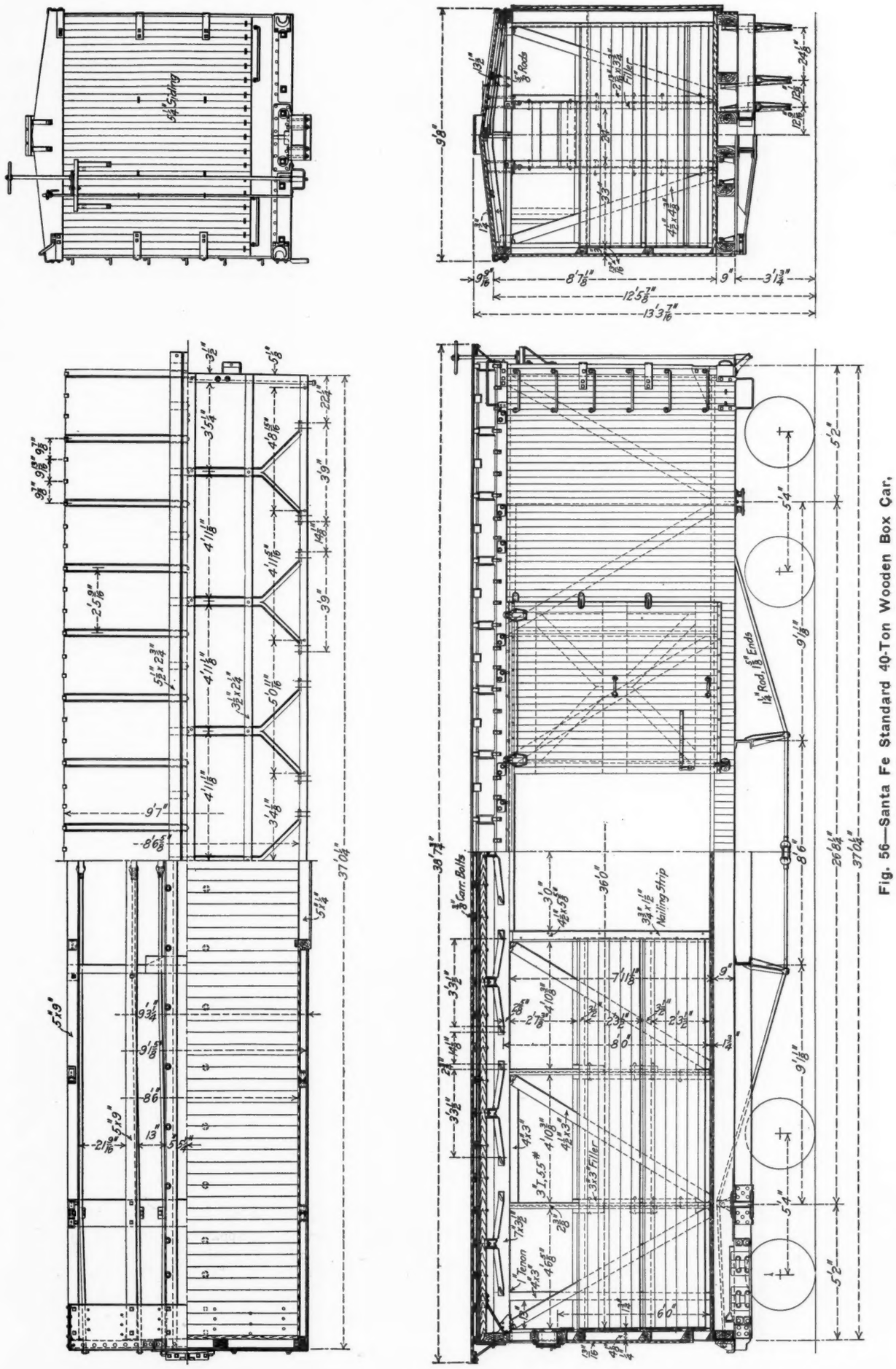


Fig. 56—Santa Fe Standard 40-Ton Wooden Box Car.

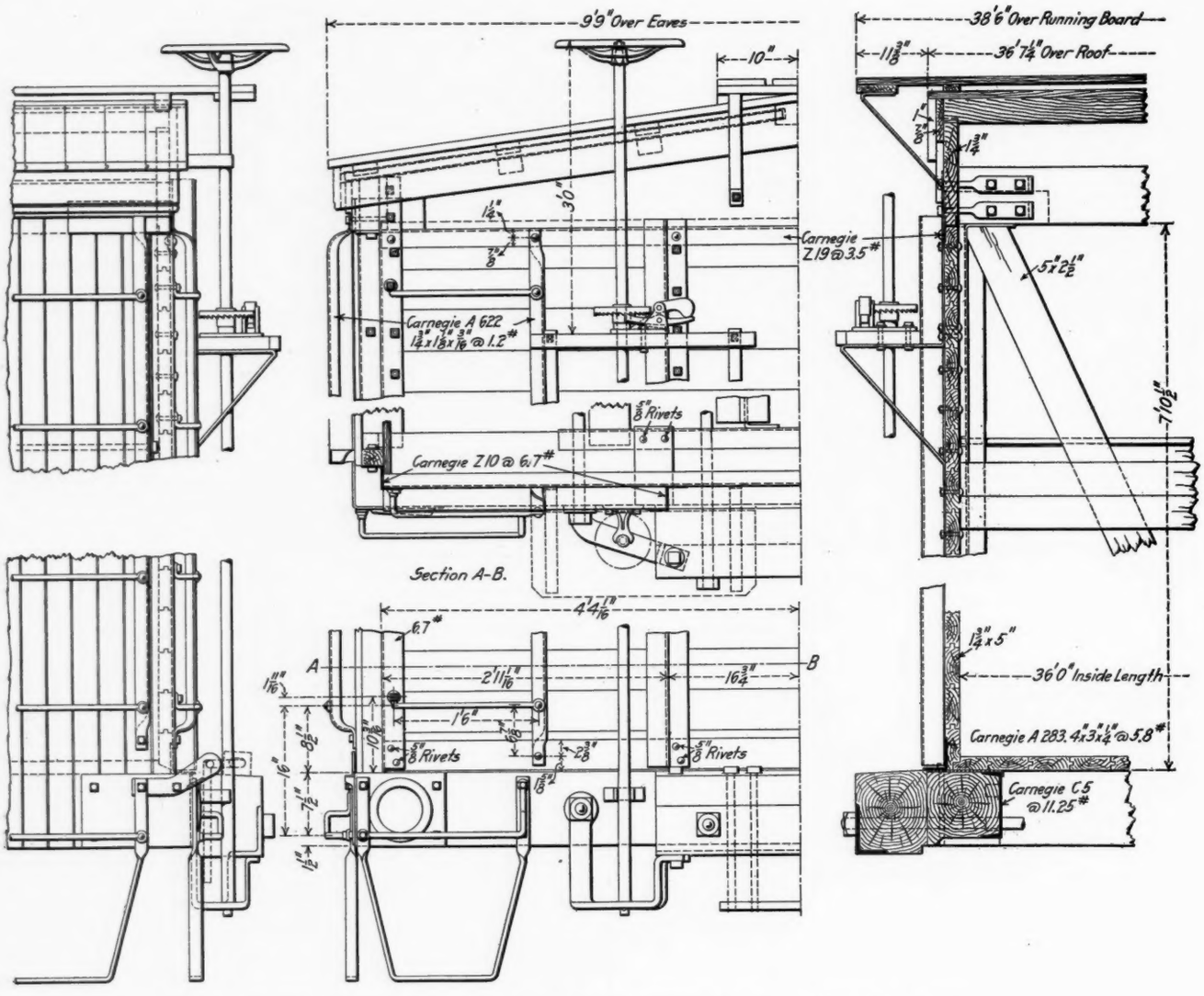


Fig. 57—Reinforced End Construction on Canadian Pacific Wooden Box Car.

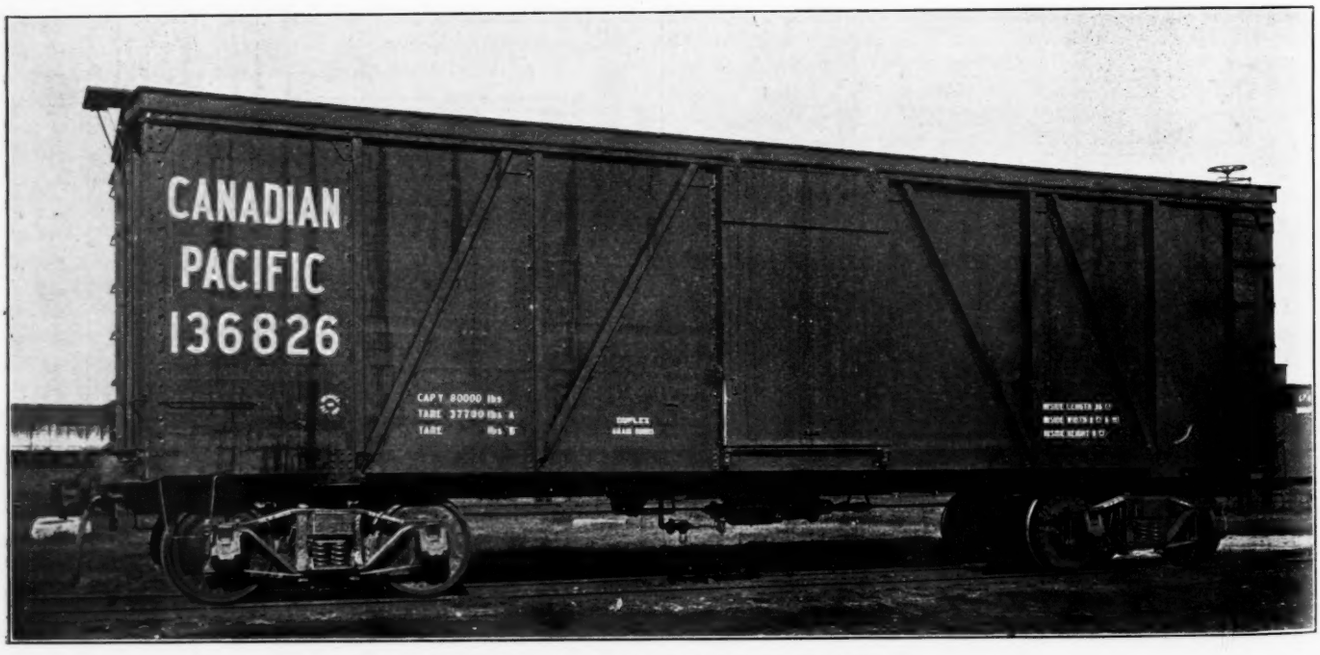


Fig. 58—Canadian Pacific Steel Frame Box Car.

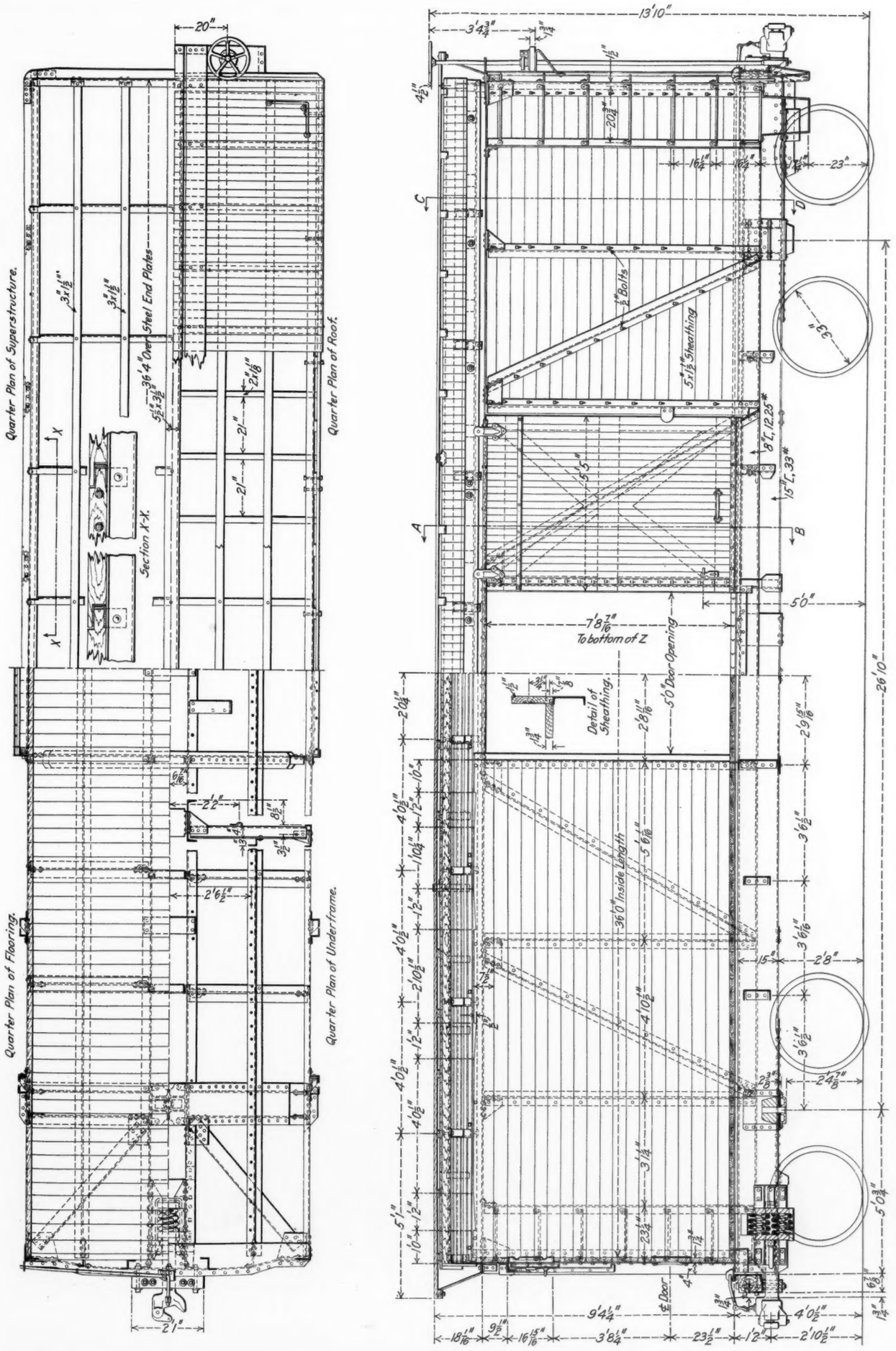


Fig. 59—Canadian Pacific Standard 40-Ton Steel Frame Box Car.

facilities for drying the lumber properly, but no doubt they will be glad to provide them if this type or a similar type of car should be adopted more or less generally.

The first cars which were built had four end posts in addition to the corner posts, but the later cars have only two end posts, the intermediate posts being removed. These ends have given excellent service; the joint between the floor and the lining is the same as between the sides and the floor (Fig. 35, April 26, 1912, page 956) and prevents any possibility of the leakage of grain or similar lading.

In most cases where these cars have been side raked it has only been necessary to remove the lining, straighten up the posts and replace the lining. On cars which have been cornered in accidents which would have destroyed an ordinary type of car, the corner section has been removed and replaced without disturbing the rest of the car framing.

These cars were fully described in the *Railway Age Gazette* of March 10, 1911, page 55. An inside metal roof is used and the construction of the roof frame is such as to require an extremely small width over the eaves, as may be seen by referring to the end view of the car.

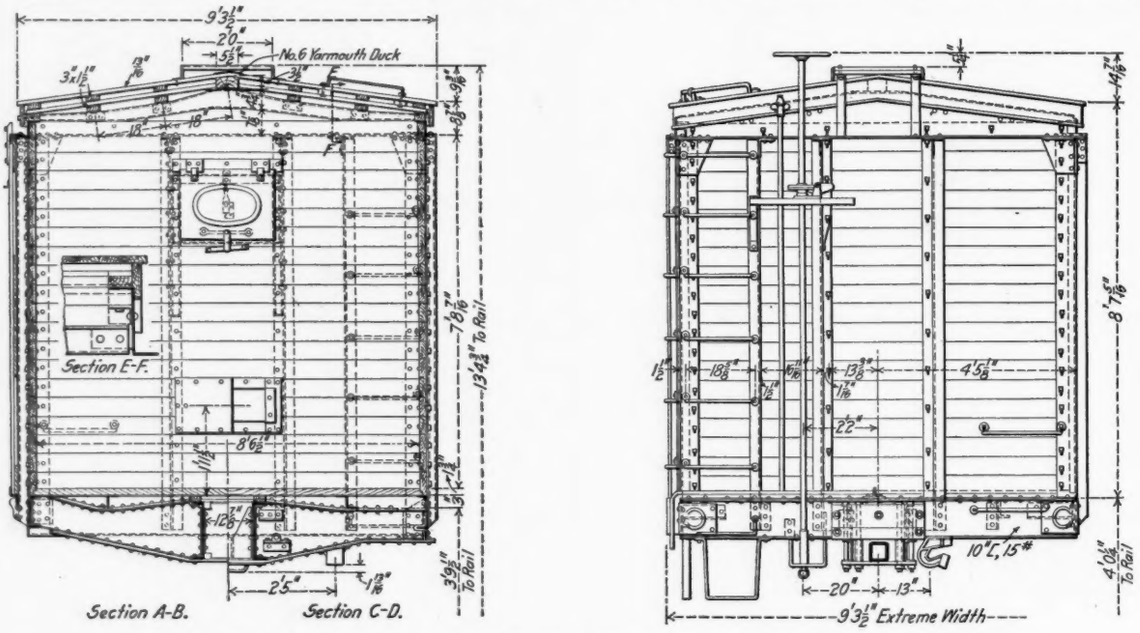


Fig. 60—End View and Sections Through Canadian Pacific Steel Frame Box Car.

Fig. 61—End View of Canadian Pacific Steel Frame Box Car.

The details of the side door, but as applied to a wooden frame car, are shown in Figs. 62 and 63. A Security door is used with a 1¼ in. x 1¼ in. x ¼ in. angle to stiffen it horizontally near the top. The door guides are held by ½ in. bolts, with the ends riveted over the guide instead of being secured by nuts. The door guides, therefore, cannot be removed without cutting off the rivet head. The staple for the door hasp is secured by nuts with large washers on the inside of the door. The ends of the staple are riveted over after the nuts are screwed on, and it cannot be pried loose without tearing the door badly. In place of the two washers shown on the drawing the former practice was to use a single washer 2 in. x 10 in. x 1/16 in. The lower edge of the door is reinforced by a Z-bar; the rear end of the lower leg of this bar is bent outward so that the door is wedged tight against the car when this part of the bar comes in contact with the guide as the door is closed. The door post is not reinforced, but is larger than that ordinarily used, being 2 in. x 3 in. in section. Better results would probably be obtained by reinforcing this post.

The end doors are of steel construction and fit tightly in place. The details are not illustrated as additional improvements are now being made in the design of these doors.

ALL-STEEL BOX CAR.

Recent years have shown a wonderful increase in the amount of steel used in box car construction. With the increasing price of lumber and the difficulty in securing the proper quality for car construction, steel has been found to be as cheap as and, when maintenance is considered, even cheaper than wood. Steel box cars have been considered for a long time, and two designs of this type of car have been experimented with in service. Such defects as have developed thus far can be remedied, and now that better box car construction is imperative and the probabilities are that there will not be much difference in the first cost of a wood and an all-steel car—with a possibility of greatly

reduced maintenance costs in the case of the steel car—the latter must be given careful consideration.

The Union Pacific was the first to introduce a modern all-steel box car, and now has 27 of them in service. A description of one of these cars will be found in the *Railway Age Gazette* of February 11, 1910. It is understood that they have given good results in service and we hope to present more complete data concerning them in the near future.

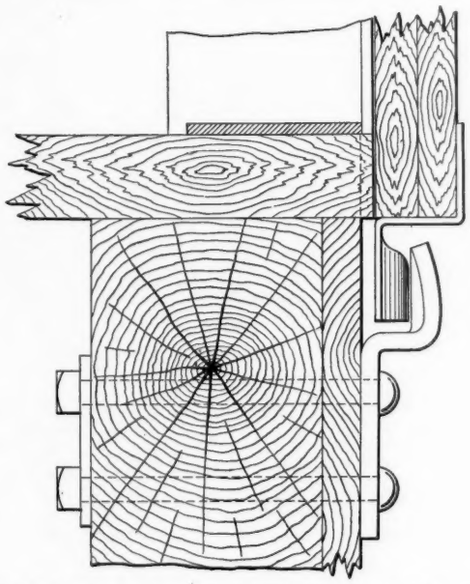


Fig. 62—Door Guide Bracket Riveted to Side Sill.

An all-steel box car of the Summers type has been in service for about two years, and is said to have given perfect satisfaction in the hauling of cement which is loaded in bulk. No difficulty has been caused by sweating on the inside of the car, as was predicted by some of those who were familiar with the iron box cars which were used on the Baltimore & Ohio in the early history of that road. In order to carry tin plate a car must be moisture proof, and that the steel box car is satisfactory for this service is indicated by the fact that last spring this car carried a load of tin plate from Pittsburgh to the Pacific coast and delivered it in good condition. Based upon two years' service of the car the Bessemer & Lake Erie has ordered 100 more of these cars to be used in the cement trade. The con-

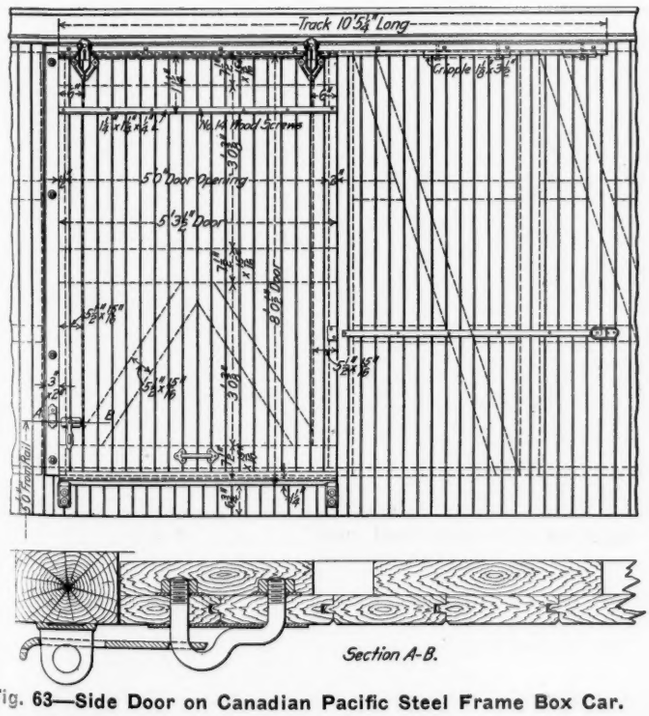


Fig. 63—Side Door on Canadian Pacific Steel Frame Box Car.

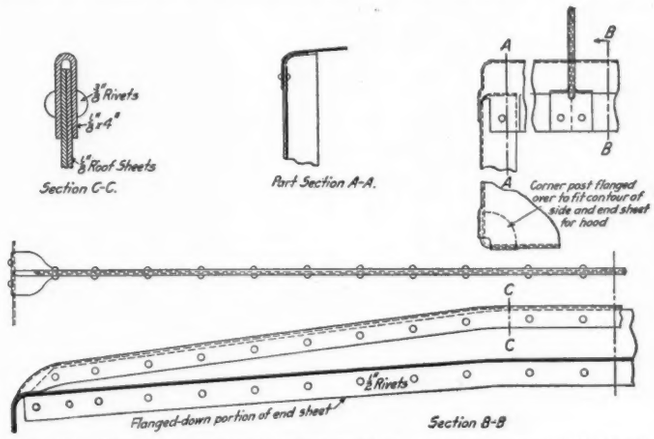


Fig. 64—Details of Roof Construction on Summers' All-Steel Box Car.

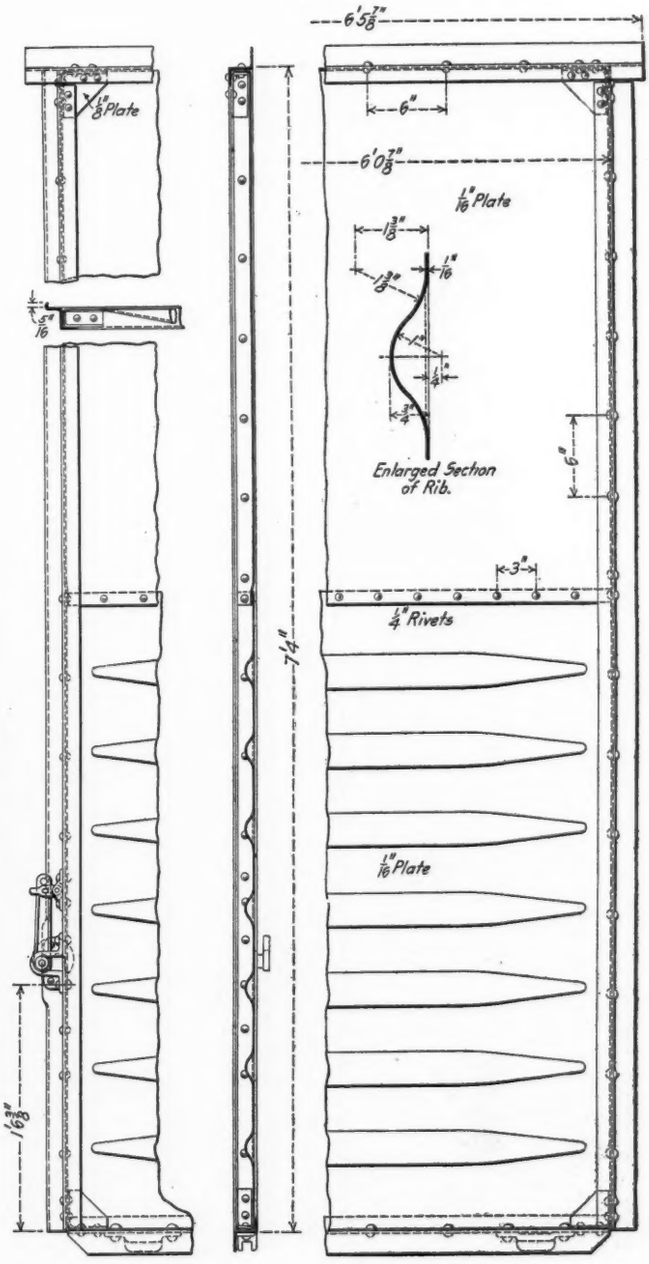


Fig. 65—Steel Side Door on Summers' All-Steel Box Car.

struction was described in more or less detail in the *Railway Age Gazette* of March 22, page 677.

The roofing and the door details were not clearly shown, however, and in-as-much as these parts have an extremely important bearing on the loss and damage to freight, as indicated in previous articles of this series, it is proposed to describe them somewhat more in detail. The details of the roof construction are shown in Fig. 64. The ⅛ in. roof sheets extend across the top of the car and are about 36 in. wide. They are flanged upward at the edges and the flanges of the adjacent sheets are capped by the ⅛ in. x 4 in. sheet, which is formed to a *U* shape to fit over the flanges and is riveted to them, as is shown in the section *CC*, Fig. 64. This construction leaves a smooth surface on the inside of the roof and the arrangement of the cap over the edges of the roof sheets is such that there can be no possibility of leakage. The sheets at the end of the car are flanged down and riveted to the end sheet, as indicated on the drawing. The running board is bolted to angles, which are riveted to the projecting ribs of the roof. This forms a strong and moisture proof roof construction.

The details of the side door which will be used on the 100 Bessemer & Lake Erie cars are shown in Figs. 65, 66 and 67. The lower part of the door is constructed of 1/16 in. plate, which is corrugated to stiffen it. The upper half of the door, which will not be subjected to the stresses caused by lading being piled or shifted against it, is made 1/16-in. plate without the corrugations. The sides, top and bottom of the door

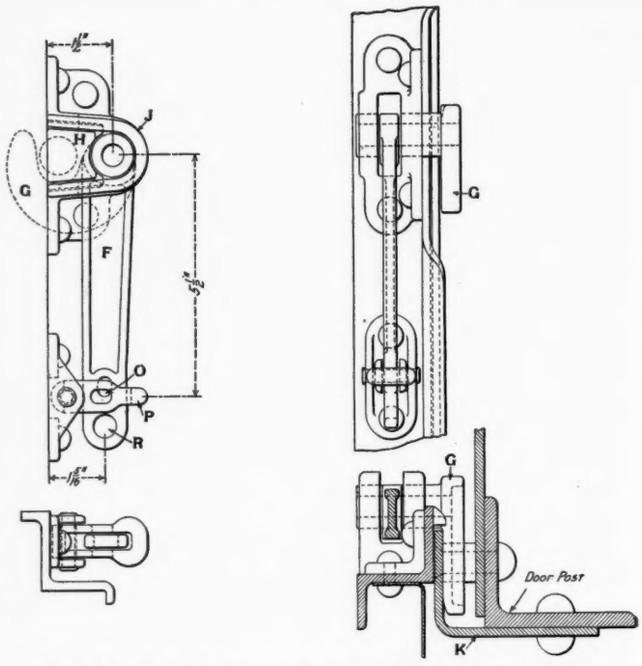


Fig. 67—Door Latch on Summers' All-Steel Box Car.

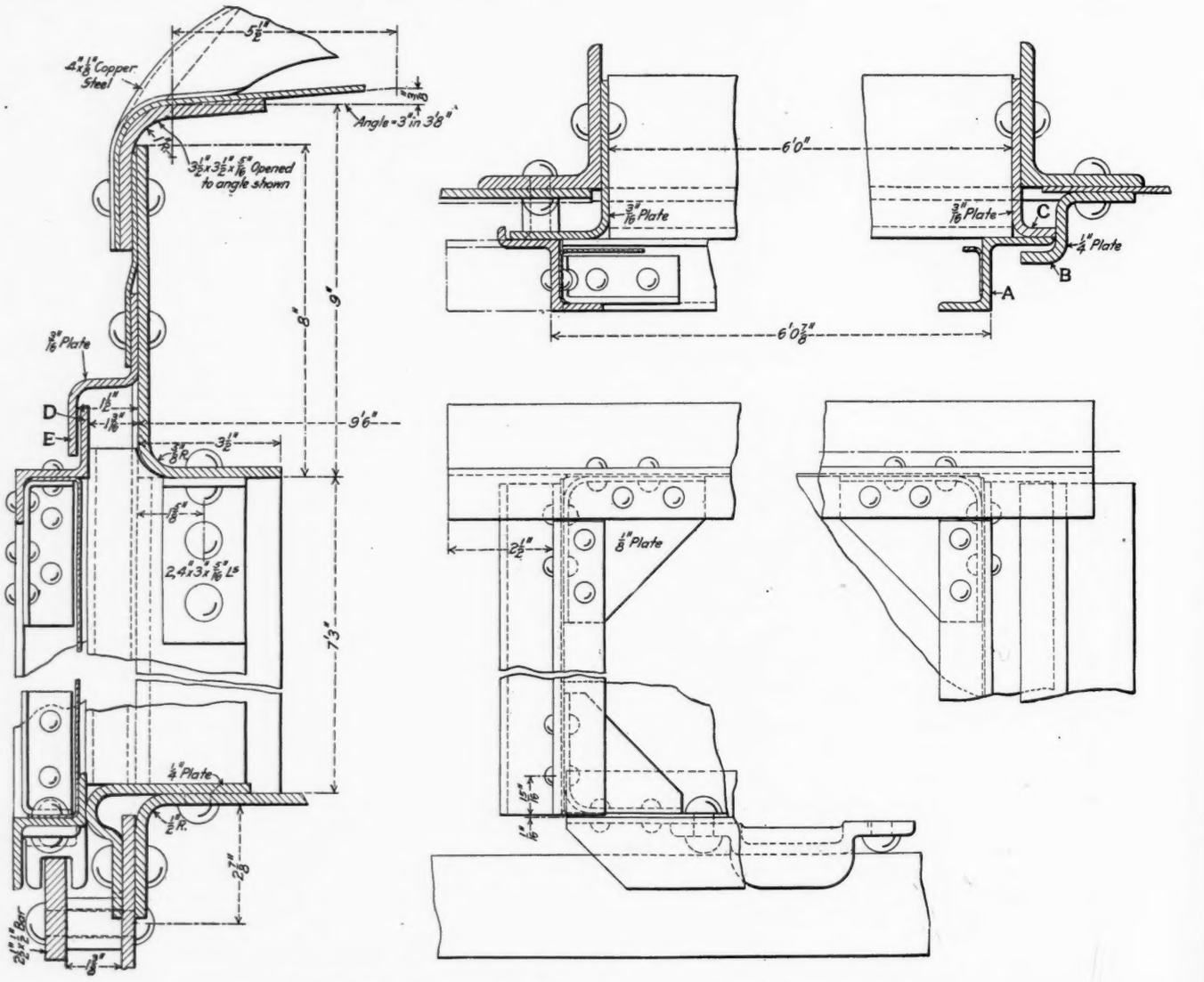


Fig. 66—Details of Steel Side Door on Summers' All-Steel Box Car.

are reinforced by Carnegie 1¼ in. x 1¾ in. x 1¾ in. x 3/16 in. Z-bars. The door is fitted at the bottom with two cast iron shoes, which slide on a ½ in. x 2½ in. bar. The details shown in Fig. 66 give some idea as to the ability of this door to protect the car against the entrance of moisture and cinders. The fixture for locking the door is placed at the rear, and the Z-bar *A* at the front end of the door slides between the parts *B* and *C* with only a comparatively small amount of clearance between them. The upward projecting edge of the Z-bar *D* at the top of the door slides behind the 3/16 in. plate *E* with a large overlap, so that there is very little possibility of moisture entering at this point.

The latch which is used on the door is shown in Fig. 67. The latch, or hook lever *F*, has a hook *G* which is cast integral with it. The pin or journal about which the lever swings has an inner half bearing *H* which fits in a pocket in the outer half bearing *J*, the latter being riveted to the car by four rivets. When the latch is closed the hook *G* engages with the plate *K*, locking the door securely in position. The Z-bar at the rear end of the door is turned over to engage the end of *K*, except for a short distance where the hook *G* engages plate *K*. When the latch is locked the end of the latch lever *F* is engaged by the U member *P*, which swings over it. The seal can then be placed through the hole *O*, or if necessary a padlock may be locked through the hole *R*. It is possible to make a door of this kind just as moisture, cinder and burglar proof as the wooden door; at the same time it is stronger and will undoubtedly cost less to maintain.

CONCLUSIONS.

A much better box car than the great majority of those now in service is absolutely necessary, not only to reduce the claims for loss and damage to freight, which are now excessive, but also to reduce the cost of maintenance of the cars.

The defects responsible for this loss and damage can be remedied very largely if those in charge of design, purchase and maintenance of the cars will awake to a realization of the seriousness of the situation.

In this series of articles, of which this is the last, the more important defects responsible for loss and damage to freight have been clearly pointed out and practical remedies have been suggested.

Moreover, we have illustrated box cars which, more than any others of their particular types, have given satisfactory results in these respects in actual service.

While the articles have thus proved doubly constructive, another recommendation has been made, which, if adopted, should make it possible within a reasonable time to get the entire box car equipment of this country into first class condition. That is, that the American Railway Association establish a bureau in charge of capable and experienced men whose function it shall be to pass on all new designs of box cars and see that the cars are free from defects which may cause loss or damage to the lading. In addition to this the bureau should maintain inspectors at the car building plants to see that the cars are constructed so as to be free from such defects. That the condition of the present box car equipment, which is now in bad shape generally, as pointed out in the earlier articles in this series, shall be improved, it is recommended that the proposed bureau shall not only indicate such changes as should be made in the present equipment as it goes through the shops for heavy repairs, but shall have inspectors to follow up the recommendation and see that they are put into effect. The formation of such a bureau is necessary, because, while the cars are owned by the individual roads, they are used generally by all the roads, and unless all combine and co-operate to provide better equipment the best results cannot be secured.

The Bauchi Railway, Nigeria, has been opened to traffic between Zaria and Rahamma.

INCREASED INSPECTION AT RAIL MILLS.

A very important step in advance of general practice in the inspection of rails is being made for a number of the larger railway systems. Until recently the inspection of rails has been confined to inspection and physical tests of the finished product, combined with chemical analyses furnished by the mills. Recent investigation and discussion regarding defective rails led several railway executives and rail experts to the conclusion that a large part of these poor rails could be eliminated by a more thorough inspection on behalf of the railways of the milling processes; and Robert W. Hunt & Company, who have for many years represented a large number of the railways as inspectors at the mills, have devised and put into operation within the last two months a system of increased and stricter inspection, by means of which the rail is followed through the entire process of manufacture.

The plan adopted is to place a man day and night in the converting works, either Bessemer or open hearth, another man day and night in the blooming mill, another in the rail mill, and another at the testing machine. This requires eight men in addition to the four or five inspectors now employed at each mill, the new inspection being in addition to that previously done as provided for in the different specifications under which the rails are rolled.

The inspectors in the converting works and in the blooming and rail mills closely observe whatever happens in connection with every heat, and if anything occurs contrary to the specifications under which the rails are being rolled or to the accepted good practice of that particular mill, the inspectors at once note and report that fact through the inspection office and also notify the foreman in charge of that particular turn and department of the mill, so that he can at once remedy the trouble. The nature of the deviation from the standard practice, together with the heat number, are also reported to the inspectors who pass finally on the rails before acceptance, so that, if the offense is great enough to justify it, the rails can be rejected by the railway concerned, or at least the rails from this heat can be examined more critically and watched more closely during the testing. It is expected that the foremen and workmen will be more careful when they know that their work is made a matter of permanent record.

The inspectors in the mills are given no authority to interfere with the operation of the plant by rejecting material during the process of manufacture into rails further than to report any deviation from good practice to the foreman, but by reporting the conditions under which the particular rails are made to the final inspectors, the rails in question are subjected to stricter scrutiny.

As the reports giving the records of all heats are furnished to the roads concerned, the engineering department of the road has a complete history of each heat of steel, and, in fact, of each rail. Therefore, the action of the rails in service can be watched with reference to their manufacture, a thing heretofore impossible, and important relations may be discovered between processes of manufacture and service which will tend to increase the knowledge of the art of rail manufacture and thereby increase the service and reliability of the rails, an object desired by both the manufacturers and railways.

This plan of increased inspection was first worked out for the Harriman lines, and has since been expanded, so that 15 systems, with a total mileage of over 90,000 miles, have already contracted to have their rails inspected in this manner, while a number of other leading roads are considering doing so. Among the roads for which this increased inspection has already been arranged are the following:

Harriman Lines.
Chicago & North Western.
Chicago, St. Paul, Minneapolis & Omaha.
Erie.

Chesapeake & Ohio.
Hocking Valley.
Missouri Pacific.
Illinois Central.
Central of Georgia.
Chicago, Indianapolis & Louisville.
Baltimore & Ohio.
St. Louis & San Francisco.
Atchison, Topeka & Santa Fe.
Chicago, Milwaukee & St. Paul.
Canadian Pacific.
Canadian Northern.
Grand Trunk.
Grand Trunk Pacific.
Louisville & Nashville.

Complete staffs of inspectors already have been located at the South Chicago and Gary mills of the Illinois Steel Company, the Ensley mill of the Tennessee Coal & Iron Company, the Pueblo mill of the Colorado Fuel & Iron Company and the Algoma Steel Company and Dominion Steel Company's mills. Inspectors will be located at the remaining six mills in this country as soon as the organization can be completed.

The complete development of this plan will require 96 additional men, to provide inspection for the twelve mills, and involve an increase in payroll of $135,000 to $150,000. A very gratifying feature of this development and an indication of the more satisfying relations being developed between the steel makers and the railways is the manner in which the manufacturers have co-operated with the railways and with the inspectors at those mills where the inspectors have already been placed.

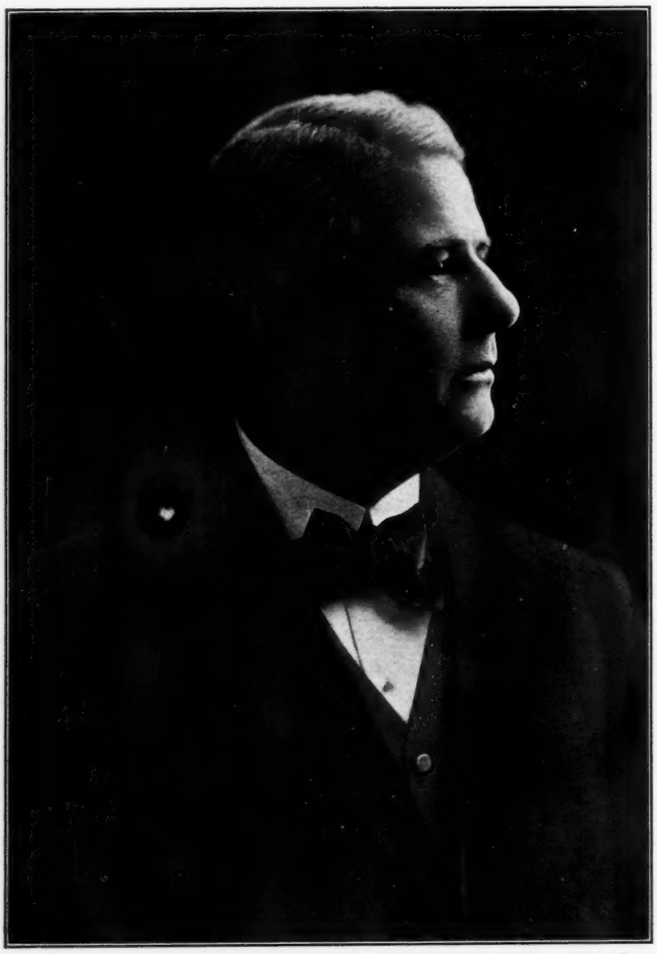
The lines of the Manila railway, Philippine Islands, now under construction, include the 40-mile line from Luta to Lucena, of which about 25 miles are completed, the 27-mile line from Calamba to Santa Cruz, of which about 15 miles are completed, the 30-mile line from Noveleta to Naic, of which about 10 miles are completed, and the 28-mile line from Paniqui to Tayug, of which about 12 miles have been completed. These lines are being built under the company's contract with the government made in 1906. Governor-general Forbes is quoted as saying that the opening of the lines of the Manila railway in 1911 has had a remarkable effect in stimulating industry and fostering production, and that territory in which crops have not been harvested for years is now being cultivated, and that particularly in the provinces of Batangas, LaLaguna and Tayabas the advent of the railway seems to have made the difference between a backward and a progressive situation.

The Philippine government has contracted for an immediate advancement of the work on the Arinjay-Naguilian railway, which is to complete the connection between Manila and Baguio.

C. R. GRAY TO BE PRESIDENT OF THE GREAT NORTHERN.

James J. Hill has announced that Carl R. Gray, president of the Spokane, Portland & Seattle, who, it had been announced previously, was to resign, is to be made president of the Great Northern, succeeding Louis W. Hill. Mr. Hill, in making the announcement, said: "I am not yet ready to state the details of the changes in the Great Northern, but both myself and my son will remain on deck subject to call. We will both be members of the executive committee."

Mr. Gray worked up to an executive position on the St. Louis & San Francisco, and it was in the service of the Frisco Lines that railway men came to know and sincerely respect him. He was born September 28, 1867. He was educated at the Arkansas Industrial University, and began railway work in 1882 as a telegraph operator for the St. Louis & San Francisco. Four years later he was transferred to the traffic department as a clerk, and in April, 1887, was appointed commercial agent. For seven years from July, 1890, he was division freight agent, and he was then transferred to the operating department as division superintendent. He was promoted to superintendent of transportation in October, 1900, and early in 1904 was appointed general manager. In November of the same year he was appointed second vice-president and general manager, and was elected vice-president in 1906. In April, 1911, he was elected president of the Spokane, Portland & Seattle, the Oregon Trunk Railway, the Astoria & Columbia River, the Oregon Electric Railway, the Pacific & Eastern and the United Railways company.



Carl R. Gray.

There are three qualities which distinguish Mr. Gray and which have contributed materially to his success. One's first and lasting impression of the man is of his alertness. It was this quality which probably first attracted attention to him on the Frisco and led to his being picked out from the other traffic department clerks and made a commercial agent. Mr. Gray, since he has held executive positions, has shown a rather remarkable diplomatic ability, especially in his dealings with the Interstate Commerce Commission and with the government. In this respect he was somewhat like Mr. Melcher, of the Rock Island. The third quality is a habit of mind and of action which is absolutely straightforward. Those under him, as well as his associates, were never for an instant left in doubt as to his squarely facing any situation that might arise. His diplomacy never gave rise to even the faintest suggestion that he would or could do anything but the square thing.

It is proposed to start preliminary construction work on the Black Sea Railway, Russia, next year. The line will be about 190 miles long, and it is proposed to use motor cars.

General News Section.

The Hudson & Manhattan has adopted Brown's discipline, about 1,000 employees being affected.

The Chicago & Alton has abolished the use of signal flags as rear end markers, the lamps serving both by day and by night.

All railways in Illinois have discontinued the sale of intoxicating liquors with or without meals on passenger trains within the state.

Eleven suits against the Erie charging violations of the federal hours-of-service law have been filed in the federal court at Cincinnati.

The annual "family meeting" of officers of the Erie was held in Chicago on May 3 and included a reception and dinner at the Congress hotel.

The fifth annual meeting of the Association of Surgeons of the Illinois Central and the Yazoo & Mississippi Valley was held at Chicago on May 5.

The Missouri railway commission has issued an order that drinking water tanks must be installed at all stations. Agents may keep on hand sanitary drinking cups to be sold at low prices.

The St. Louis, Brownsville & Mexico has erected an intermittent vacuum pre-cooling plant at San Benito, Tex., the first one to be built east of California, for preparing vegetables for shipment.

The Chicago, Burlington & Quincy was fined $300 in the federal court at Kansas City on May 3 for violation of the safety appliance law in running a train in its yards with less than 75 per cent. of the air brakes coupled.

The Illinois Central was indicted by the federal grand jury at Chicago on May 3 for violation of the federal laws regulating the interstate shipment of cattle, in transporting a carload of cattle from the State of Mississippi without inspection during a period of quarantine.

The United States district attorney at Cincinnati filed suit in the federal court on May 3 against the Chesapeake & Ohio charging 29 violations of the hours-of-service laws during October, November and December, 1911, and asking penalties of $14,500. A similar suit was filed against the Wabash asking $1,500 in penalties for three violations of the act.

Committees representing conductors, brakemen and firemen have called upon the general manager of the Pennsylvania asking for conferences relative to numerous grievances, none of which, however, deal with wages or hours of labor. It is said that these committees have been conferring together in Philadelphia for several weeks past. The firemen of the Grand Trunk are asking for a 20 per cent. increase in pay. The enginemen of that road were recently given a 10 per cent. increase.

Hearings in the suit of the government against the United States Steel Corporation were begun in New York City this week, Henry P. Brown, an examiner appointed by the circuit court, conducting the investigation. The first two days were devoted to preparatory operations and to questions concerning the doings of the makers of wire and of horse shoes in fixing prices. Jacob M. Dickinson, formerly secretary of war, is acting as special counsel for the government, and the chief counsel for the defendant is Richard V. Lindabury.

The United States House of Representatives has passed a bill legalizing the sale by the Union Pacific of certain parcels of land along its right of way. The original right of way granted the Union Pacific through Kansas, Nebraska and Colorado was 400 ft. wide, of which only 100 ft. were used for railway purposes and a good part of the rest sold. The Senate is considering a similar bill. The Union Pacific has been attempting to recover the lands and numerous suits have resulted. The Supreme Court recently decided that the railway was not entitled to any of the right of way which it did not use.

The Interstate Commerce Commission has issued Accident Bulletin No. 42. It shows that 242 persons were killed and 4,706 injured in train accidents during the three months ending with December, 1911. Adding other accidents, but excluding industrial accidents, the total of casualties for the quarter is 22,682 (2,726 killed and 19,956 injured). In industrial accidents (in which the movement of locomotives or cars was not involved) 78 employees were killed and 21,634 injured. Of the 2,726 killed 1,419 were trespassers. The Bulletin includes a synopsis of the reports on fifteen accidents which have been investigated by the chief inspector of safety appliances.

President Williard, of the Baltimore & Ohio, has been selected by the eastern railways to act as their representative on the board to be appointed to arbitrate the demands of the enginemen in eastern territory, P. H. Morrissey, as noted last week, being the representative of the enginemen. B. A. Worthington, receiver of the Wheeling & Lake Erie, and a member of the conference committee of managers, will prepare and present the case for the railways when the board of arbitration begins its hearings. A. W. Sullivan, who has been serving as secretary of the conference committee, has resigned, the preliminary work having been completed, in order to devote all his time to his duties as chairman of the committee on railway mail pay. Martin Quick succeeds him as secretary of the conference committee.

The terminal commission, acting in behalf of the city of Buffalo, which has for a long time been considering the problem of a new Union station for that city, has finally agreed upon a plan which would make use of the large rectangular space bounded by Washington, Exchange, Michigan and Scott streets, with a plaza extending westward to Main street. The present station of the New York Central fronts on Exchange street, and the proposed plan would extend the track yard back from the station (southward) to Scott street, taking in the Hamburg canal territory. The commission proposes that the new station shall be used by the New York Central and the other lines now occupying the present station, and also by the Lehigh Valley, the Erie and Wabash. A part of the land embraced in the plan is owned by the Lehigh Valley. The proposed site is wide enough for 37 tracks.

The employees' compensation bill passed the Senate at Washington this week by a vote of 64 to 15, but not until it had been vehemently opposed by a few senators. This bill, noticed in the *Railway Age Gazette* of March 15, page 472, was prepared with much care by a special commission and was recommended to Congress by President Taft. It provides that accidental disability or death of employees shall be subject to compensation, to be paid by the employer, and applies to all persons engaged in interstate commerce by railway. Numerous changes were proposed by senators and the opposition was so strong that three hours were occupied on Monday in taking roll calls, but only a few amendments were accepted, and these were of such character that Senator Sutherland, in charge of the bill, accepted them. One of the changes modifies the period during which children shall receive compensation; the age of 16, the ordinary limit, is to be extended, in the case of a daughter, to the age of 20, unless she marries before that age. The opposition to the bill seems to be based mainly on the claim that injustice will be done to railway employees who suffer serious injuries by fault of the employer and who, under present laws, may sue for heavy damages—much heavier than would be allowed under the proposed law. One of the objecting senators said that the officers of the labor unions, in endorsing the bill have not fairly represented their constituents; but, on the other hand, some of the observers at Washington say that the opposition has come mainly from senators who, under the present law, make a good deal of money out of their work in prosecuting suits against the railways.

Employees' Compensation—First Decision.

The California Industrial Accident Board, in its first decision, holds that Harry Christ, an employee of the Pacific Telephone and Telegraph Company, who lost an eye while at work, is entitled to receive $100 for medical and surgical expenses, full wages for time in hospital, 65 per cent. of his wages for the following eight weeks, and 65 per cent. of his estimated loss in earning capacity thereafter for a maximum period of 15 years.

The board finds that although the loss of an eye does not necessarily impair a man's earning capacity, it increases the difficulty of finding work.

Tap Line Decision Causes Conflict.

A peculiar situation has grown out of the decision of the Interstate Commerce Commission in the tap line cases, reported in our issue of last week. It was stated in the decision that the cancellations of tap line allowances filed by the trunk lines over a year ago, which had been suspended, would become effective May 1; and that in the near future in a supplementary report the commission would state the facts relating to the other tap lines in addition to those as to the 36 whose cases were passed on in the opinion, and would point out which of them are regarded by it as common carriers in the service they render to their respective proprietary companies.

No formal order having been made which the tap lines could appeal to the Commerce Court, before the cancellation should become effective, the attorneys for the tap lines decided to secure injunctions in the state courts, forbidding the cancellation of the joint tariffs, on the ground that irreparable damage would be done if the trunk lines were permitted to withdraw them. Restraining orders were issued by the state circuit court at St. Louis on April 30 on the petition of seven St. Louis lumber firms against twelve railways, returnable May 11; and on application of the Warren, Johnsville & Saline River Railway versus the Chicago, Rock Island & Pacific returnable May 13. The tap lines involved were not included in the 36 cases passed on by the commission. Similar injunctions were secured in Arkansas.

The trunk lines advised the Interstate Commerce Commission of the injunction proceedings, and received a telegram from Secretary J. H. Marble, stating that the cancellations had taken effect at midnight on April 30, and that "rates as filed must be observed by carriers and shippers if criminal violation of the Interstate Commerce act and the Elkins act is to be avoided." The railways, therefore, ignored the injunctions. It is understood that conferences will be held looking to an understanding between the shippers, carriers and commission pending the issuance of the supplemental report.

Freight Handlers' Strike at Chicago.

A large number of the members of the Brotherhood of Railroad Freight Handlers at Chicago, including freight clerks and checkers, claimed to be 6,000, went out on strike May 4, after the railways had refused to grant their demands for higher pay and shorter hours. The demands presented on April 1 were for an increase of $5 a month for the men employed on a monthly basis and of one cent an hour for those paid by the hour; a half holiday on Saturdays with pay; a nine-hour instead of a ten-hour day for the freight handlers; an eight-hour instead of a nine-hour day for the clerks; time and a half for overtime, and double time on Sundays. A second proposition was met by the managers with an offer of one-half cent an hour and $2.50 a month increases, but with no reduction in hours. The managers were then served with an ultimatum that the strike would be called unless one of the two propositions was accepted and made no reply.

As we go to press, the railways say that perishable freight is and has been moving with little trouble, and no serious delay. Mr. Garrett, chairman of the General Managers' Association, says that only 1,000 men are out, and that the strikers will be defeated.

Monument to Charles Minot.

The bronze tablet, which has been set up at Harriman, N. Y., commemorating the first telegraphic train order, which was sent from Turner (now Harriman) in 1851, was dedicated with appropriate ceremonies on Thursday, May 2, in the presence of several hundred railway men, telegraphers, and citizens of the locality, including a large company of school children, who sang "America." The station and other buildings were decorated profusely with flags. Turner is 48 miles west of New York, on the Erie Railroad. Its present name, Harriman, was adopted in honor of the late Edward H. Harriman, whose summer residence was near this place. The granite monument on which the bronze tablet is fixed was quarried on the Harriman estate, and its cost, including the cutting and setting, was paid by Mrs. Harriman, who was present at the unveiling.

E. P. Griffith, superintendent of telegraph of the Erie Railroad and chairman of the committee which originated the project and which collected the funds with which to pay for the tablet, presided at the ceremonies, and his young daughter, Gertrude, unveiled the tablet. The principal address was given by H. D. Estabrook, a lawyer of New York City and a member of the firm of Noble, Estabrook & McHarg. Mr. Estabrook was formerly one of the counsel of the Western Union Telegraph Company, and gave an eloquent and appropriate talk, evincing a practical and sympathetic acquaintance with telegraphic and railway affairs.

The monument stands on the site of the old station, a short distance west of the present building. The speech presenting it to the Erie Railroad Company was made by D. H. Bates, of New York, a well-known "old timer" of the telegraph, who was in the telegraph service of the government at Washington during the civil war, and who is now secretary of the Society of the United States Military Telegraph Corps. Mr. Bates, in his address, joined in the glorification of the train despatcher by telling of the movement of 23,000 troops with their horses and baggage from the region of Washington to Chattanooga in September, 1863, when the Union cause was in a desperate situation following the battle of Chickamauga. This movement was over the Baltimore & Ohio to Wheeling and thence by way of Columbus, Indianapolis, Louisville, Nashville and Stevenson, nearly the whole of the route, 1,233 miles, being at that time single track. The whole movement was accomplished in 11 days.

The monument was accepted on the part of the Erie Railroad by George N. Orcutt, general attorney of the company. President F. D. Underwood and numerous other officers of the Erie were present. Colonel R. C. Clowry, late president of the Western Union, and Thomas A. Edison were also there.

The tablet, which is about 6 ft. high, was designed by Charles Keck, of New York, a pupil of the late Mr. St. Gaudens. It contains at the top a medallion portrait of Mr. Minot and below copies of the famous orders. (The duplicate order system had not then been thought of.) The circumstances of this historic event, as narrated in numerous publications, will be readily recalled. Minot, superintendent of the road, being a passenger on a westbound train, was held at Turner because an eastbound train, having the right to the road, was behind time. Learning from the operator at Goshen that the eastbound had not arrived there, he ordered the agent there to hold it, if it should arrive; and then ordered the westbound train to proceed. The engineman refused to do so reckless a thing, even on a written order from the superintendent, and so Minot had to take charge of the engine himself. Arriving at Goshen, he found that he could go still farther, on the time of the eastbound train, and repeated the telegraphic process with Middletown, and then with Port Jervis. Mr. Minot was born in Haverhill, Mass., and before going to the Erie had been superintendent of the Boston & Maine.

Locomotive Firemen's Demands in Eastern Territory.

President W. S. Carter, of the Brotherhood of Locomotive Firemen and Enginemen, last week submitted to the conference committee of managers representing the 50 roads in eastern territory a proposed schedule of rates of pay and conditions of service for firemen. The committee has not yet met to consider the demands, but will presumably do so on May 15, the date of their next meeting.

The proposed scale seems to call for an increase of at least $25,000,000 a year in pay, of which about $16,000,000 would be required for the "assistant firemen" which are asked for on all coal-burning locomotives.

The demands are as follows:

PASSENGER SERVICE.

Article 1.—On engines weighing 100 tons or over, exclusive of tender	$2.70
On engines weighing 70 tons or over, and less than 100 tons, exclusive of tender	2.60
On engines weighing less than 70 tons, exclusive of tender	2.50

THROUGH FREIGHT SERVICE.

Article 2.—On engines weighing 120 tons or over, exclusive of tender (including Mallet and mikado type engines)	$4.00
On engines weighing 90 tons or over, and less than 120 tons, exclusive of tender	3.25

On engines weighing 60 tons or over, and less than 90 tons, exclusive of tender 3,00
On engines weighing less than 60 tons, exclusive of tender..... 2.85

LOCAL, WAY FREIGHT, PICK UP AND SET OUT RUNS.

Article 3.—On local, way freight, pick up and set out runs the rate shall be twenty-five (25) cents per day of 100 miles, or 10 hours, in excess of through freight rates, as per class of engine used.

ELECTRIC LOCOMOTIVES.

Article 4.—The rates of pay fixed herein for firing steam locomotives shall apply to helpers on electric locomotives in the same class of service.

MALLET TYPE ENGINES.

Article 5.—On Mallet type engines, when used in pusher or helper service, firemen shall be paid $3 per day of sixty (60) miles or less, six hours or less. On grades or divisions of more than ten (10) miles in length, relief firemen will be furnished, and no fireman will be required to fire for more than six hours or sixty miles in any twenty-four hour period. Should a smaller class of engine be substituted for a Mallet engine after making one trip, or vice versa, the miles, hours and rates of pay as applied to the Mallet engine shall prevail.

SWITCHING SERVICE.

Article 6.—Switching, per day of ten hours or less.....$2.60

HOSTLERS.

Article 7.—Road hostlers, per day of ten hours or less.....$3.75
Road hostlers firemen, per day of ten hours or less..... 2.50
Hostlers employed in handling engines in and about the engine house and shop, per day of ten hours or less..... 2.50

Article 8.—In all classes of service, not herein specified, firemen shall be paid freight rates, according to class of engine.

A DAY'S WORK.

Article 9.—Ten hours or less, 100 miles or less, shall constitute a day's work in all classes of service, except as otherwise specified. The time of firemen will be computed from time required to register at engine house or report for duty, and end when engine is delivered at point designated by the company.

OVERTIME.

Article 10.—All mileage in excess of 100 miles made within a ten-hour period shall be paid for at mileage rates. All mileage or time made, after the expiration of ten hours on duty (this to include yard service), shall be paid for on a basis of time and one-half, it being understood that the miles run and hours worked shall not be counted together, but where miles exceed hours, miles will be allowed, and where hours exceed miles, time will be allowed on a basis of one mile for each four minutes. Less than four minutes will not be counted.

HELD AWAY FROM HOME.

Article 11.—Firemen held at other than home terminal will be paid continuous time for all time so held after the expiration of fifteen hours from time registered off duty.

WORK NOT REQUIRED OF FIREMEN.

Article 12.—Firemen shall be relieved from all cleaning of engines, tanks, fires and flues, scouring of brass, painting of stacks, smoke arches and front ends.

LIMITATION OF SCHEDULE.

Article 13.—Rates that are higher and conditions that are better in existing schedules shall be maintained.

ASSISTANT FIREMEN.

Article 14.—On coal-burning locomotives in freight service a fireman and an assistant fireman shall be employed.

Article 15.—The assistant fireman shall assist the fireman in the prescribed duties incident to the firing of a locomotive.

Article 16.—The standing and rates of pay for assistant firemen to be as may be agreed upon at a conference with the general managers.

Article 17.—On all coal-burning locomotives in passenger service, coal shall be kept within reach of the firemen from the deck of the engine.

Article 18.—It being understood that the provisions of paragraphs (14) and (15) shall not interfere with any agreement now in effect, or that may hereafter be made in connection with the employment of two firemen on one locomotive, except by mutual agreement.

To Permit the Merger of the B. & M. and the New Haven.

The legislative committee on railways of Massachusetts has voted to report the bill for consolidation of Boston & Maine and New York, New Haven & Hartford. The bill will provide for a lease of the B. & M. to New Haven on terms to be approved by the railway commissioners and accepted by the New Haven, within six months after the passage of the act. The New Haven shall acquire two-thirds of the stock of the Boston & Maine.

Boston & Maine minority stockholders opposing the lease may have the value of their shares adjudicated by the railway commission. The bill provides for the expenditure of $80,000,000 by the New Haven, at the rate of $16,000,000 a year.

The bill provides for the electrification of all railways within the metropolitan district, electrification to be completed within five years. The New Haven is to acquire the stock of the Boston & Maine now held by the Boston Railroad Holding Company, which latter company is automatically dissolved. A tunnel to East Boston is not provided for, except should great emergency so demand, and in that event only when agreed on by the railway commissioners and the directors of the port of Boston.

The bill reserves to the commonwealth the right to take over the railways within the electrified zone at any time and thereby terminate the lease. The tracks of the existing railways may be used by any other railway corporations, the charges to be fixed and approved by the railway commission. The railway commission is given authority to fix rates and determine facilities, the rates and facilities at all times to be subject to revision by the Supreme Court.

The Boston & Albany is required to spend $20,000,000 in electrification, bringing the total expenditure involved in the project up to $100,000,000.

The bill provides that there shall be no switching charges to any of the terminals, or anywhere within the electrified zone. It is provided that the New Haven shall build a tunnel between the North and South stations, and this tunnel, with the approval of the railway commissioners and the tranist commissioners sitting jointly, may be extended under the Charles river to a point either in Charlestown or Cambridge, and in that event it will do away with all except one of the bridges over the Charles river. This provision is made in order to meet the requirements of the Navy department. No special reference is contained in the bill to the Grand Trunk, but it is so drawn as to permit any outside railway to enter Boston over the tracks of existing roads. No provision for the establishment of a public utilities commission recommended by Governor Foss is made.

Disastrous Derailment at Hattiesburg, Miss.

In the derailment of a passenger train on the New Orleans & Northeastern near Hattiesburg, Miss., on Monday last, four passengers and three trainmen were killed and 50 or more passengers were injured. The train was heavily loaded with Confederate veterans going to a reunion at Macon, Ga., but it is said that none of the veterans were killed. The engine and first five cars were derailed, the engine and baggage car being overturned. The train was running on a straight line at about 30 miles an hour, and it is said that the baggage car was the first vehicle to jump the track.

The Chicago Electrification Investigation.

The Chicago Association of Commerce Committee on Investigation of Smoke Abatement and Electrification of Railway Terminals recently approved a tentative outline report of the investigation, giving the progress made up to date and a sketch of the entire plan of the work.

The general scope of the investigation has been set forth by the committee as follows: (1) A determination as to the necessity of changing the motive power of steam roads to electricity or other power. (2) The mechanical or technical feasibility of such change. (3) Its financial practicability.

Much of the work during the past year has been done under the first heading. A great deal of preliminary work has also been done under the second heading. The determination of the third question necessarily depends on the results of the study of the first two.

In the study of the safety of electric operation, the consulting engineers of the committee have sent letters to 25 electric lines abroad and to the most important electric lines in this country, asking information as to the character of the line and the traffic and the number and character of injuries before and after electrification, and on similar steam lines during a corresponding period. Such replies as have been received indicate that exact comparisons may not be feasible, but it is expected that reliable conclusions may be reached regarding the general question of comparative safety.

An effort has been made to check up estimates of the effect of smoke on property that have been made for various cities, but all this information is of the most general character, and affords no original suggestions for the establishment of a method for the determination of loss.

Accounts have been prepared of existing as well as of past conditions in smoke abatement in 25 or more cities in the United States, and a large collection has been made of the available published information on the subject of smoke abatement in foreign cities, some of which has required the assistance of translators.

For the classification of all existing smoke producers into six classes, a force of 20 inspectors is now taking observations of 1,000 representative smokestacks for each minute of a complete day. The reports are made on blank forms, containing squares for each minute and for the six classifications of smoke density as shown by the Ringelmann chart. Later a similar investigation will be made of locomotive smoke. Negotiations

are being made for a series of tests of fuel at the Altoona testing plant of the Pennsylvania Railroad to study visible smoke and gases, and the results of burning bituminous coal in locomotives. Information has been obtained from the railways in Chicago as to the amounts and origin of the various kinds of coal supplied to their locomotives, and they have been asked to furnish 16 cars of representative coal for test purposes. Tests have been conducted on the Atchison, Topeka & Santa Fe with a switching locomotive, as described in the *Railway Age Gazette* of February 23, page 343, and additional tests are contemplated to determine the amount of smoke and cinders, fuel dust and soot for other kinds of service.

The Ringelmann chart has been used generally for comparisons by color of the density of visible smoke, and a graphic smoke recorder which has been ordered will also be used. To obtain representative samples of visible smoke from industrial stacks, it was necessary to prepare special apparatus and make several experiments. A sampling tube is inserted into a smokestack with the intake at the point of the mean velocity of the stack contents. A filter contained in the tube is so constructed that it arrests all of the cinders, fuel dust and soot in the sample, which are classified by coarse and fine sieves, the soot being separated into four divisions.

The subject of selection of fuel, the efficiency of firing and improvements in boiler design, smoke abating appliances, etc., has received due consideration by the engineering staff and will be considered further. The question of partial elimination of locomotive operation in the city by moving the main switch yards and locomotive terminals outside of the central zones, is receiving attention, and reports are being made by the railways as to the movement and number of cars.

The committee has made a thorough study of the physical characteristics of the Chicago railway terminals. There are 40 operating companies within the central zones, of which 17 own the tracks they use; seven lease the tracks, and 16 own part and lease the rest of the tracks they use. The lines operated are classified as 25 trunk lines, 6 belt lines and 9 industrial lines. Reports have been received from all the railways showing the movement of all classes of service for one week during the months of January, March, May, July, September, October and December, and observations and tests will be made in representative yards during several periods throughout the year to determine the average tonnage moved in yard service and the relation between idle and working time of yard locomotives.

Careful study and research has been made for the purpose of obtaining an accurate estimate of the probable conditions and characteristics of the Chicago railway terminals at the end of 1917. This includes studies of census reports and other data affecting the growth of population and the additions by annexation. For purposes of comparison similar statistics are being gathered for communities within 50 miles of Chicago and for 50 of the largest cities in the United States.

Texas Welfare Commission Hears from Railways.

The Texas Welfare Commission, which has been holding a series of hearings for the purpose of discussing legislation to improve the condition of the state, has received some advice from railway men who were asked to express opinions regarding needed railway legislation. H. G. Askew, statistician of the Texas railways, submitted a series of compilations showing comparative conditions for the ten years since 1901, during which time the gross operating revenues had increased 71 per cent., the operating expenses 93 per cent., and the mileage operated 49 per cent.

Frank Trumbull, chairman of the executive committee of the Missouri, Kansas & Texas, appeared on April 30 and urged the necessity of a slight advance in rates to bring the finances of the Texas roads up to a level with those in other states. He also declared that the roads should be permitted to issue bonds for improvements without reference to previous issues, to refund bonds now maturing which had been issued before the passage of the present stock and bond laws, and to issue bonds in advance of construction; also that the consolidation of connecting and lateral roads should not only be permitted but encouraged. F. G. Pettibone, vice-president of the Gulf, Colorado & Santa Fe, declared that to permit of needed improvements and extension of the Texas lines an advance of approximately 27 per cent. in rates would be required.

F. A. Vanderlip, president of the National City Bank of New York, addressed a long letter to the commission discussing the effect of present Texas laws on the railways and urging legislation providing for a revaluation of all railway property in the state to the end that a more equitable basis be adopted for the issuance of bonds and other indebtedness. He also declared that in some way the railway commission and the tax commission should co-operate in fixing valuations so that constantly changing values may have a corresponding appraisal. Mr. Vanderlip's letter was concluded with the following: "Texas roads, as a whole, are not profitable today. Such being the case, it is obvious that railway extension will not be carried on very rapidly unless some more means are taken to make them profitable. Texas, a magnificent, fertile state, with its pent-up resources and energy crying for outlets, should be fully cognizant of the tremendous importance of railway development. Intrastate business is rapidly increasing, but not to the extent that natural laws would seem to warrant. The laws of men must foster, not hamper, railway business; must permit logical and scientific financing and must make development attractive and protection ample."

It is announced that R. S. Lovett, chairman of the executive committee of the Harriman lines, will appear before the commission on May 15 at Dallas.

Compromise on Spokane Freight Rates.

A compromise agreement proposed by the traffic officers of the northern transcontinental railways providing for a temporary scale of rates to Spokane, Wash., on a basis slightly higher than that suggested by the Interstate Commerce Commission in its decision of June, 1910, was accepted by the trustees of the Chamber of Commerce and the directors of the Merchants' Association of Spokane on April 29, following a series of conferences between a committee of the railway men and representatives of the different classes of shippers in the city, as reported in last week's issue.

The agreement provided that the Spokane complainants at the hearing set by the Interstate Commerce Commission for May 8 in Washington should indicate their willingness to accept the proposed temporary tariff pending the decision on the fourth section cases by the Supreme Court, and that the railways should immediately proceed with its publication. This action is to be independent of the issues involved in the fourth section cases, and as the carriers deny the existence of any basis for reparation claims the acceptance of the proposal is without reference to any such claims.

The compromise was proposed by the railways on account of the situation created by the action of the Supreme Court in postponing its decision in the fourth section cases till next fall, whereupon the commission assigned the original Spokane and Salt Lake City cases for hearing on May 8, and suggested that the carriers and shippers in the meantime submit complete schedules of rates, mutually satisfactory, pending the final decision by the Supreme Court. The compromise basis was described by J. G. Woodworth, traffic manager of the Northern Pacific, acting as chairman of the railway committee, in the proposals submitted to the shippers, as follows:

"In the Salt Lake City case the commission prescribed certain rates as just and reasonable. While the defendant railways consider these rates to be unreasonably low, and while their petition for an injunction is yet pending in the courts they represent the only basis for reasonable rates which has been established by the commission in the intermountain territory, and for the purpose of constructing rates to Spokane which will comply with request of the commission and meet its requirements as to reasonableness the Spokane roads are willing to use these rates as a basis, and if acceptable to shippers and approved by the commission would publish a tariff from eastern defined territories to Spokane and common points on the following basis:

"As the distance, St. Paul to Spokane, approximately 1,500 miles, is 150 per cent. of the distance Omaha to Salt Lake, approximately 1,000 miles, a reasonable rate from St. Paul to Spokane would not be less than 130 per cent. of the rate from Missouri river to Salt Lake, and in the proposed tariffs rates from St. Paul to Spokane would be made accordingly.

"From Mississippi common points as defined by current tariffs, the rates would be 112½ per cent. of the St. Paul rates.

"From Chicago and common points, the rates would be 116⅔ per cent. of St. Paul rates.

"From Detroit and common points, 125 per cent. of the St. Paul rates.

"From Buffalo, Pittsburgh and common points, 130 per cent. of St. Paul rates.

"From New York, Boston and common points, 130 per cent. of St. Paul rates.

"From Colorado common points, 90 per cent. of St. Paul rates."

Class rates have already been established from eastern defined territories to Spokane and common points on the basis ordered or suggested by the Interstate Commerce Commission, and represent a reduction of first class rates ranging from 50 to 75 per cent. No further change in class rates is proposed.

The commisison established carload commodity rates on 204 items, but in the Spokane tariff it is proposed to increase the number of these items, using the basis employed in fixing the Salt Lake rates.

On April 30 the city council and the county commissioners of Spokane, which bodies had at first declined to approve the compromise, voted to accept it, thereby removing Spokane as a complainant in the case before the commission. Bankers and business men made addresses favoring the compromise, and Mayor Hindley stated that he was opposed to the city's spending another dollar in the rate contest. It was estimated that the temporary tariff would save the shippers of Spokane between $500,000 and $600,000 a year.

Charges Against Judge Archbald.

Judge Robert W. Archbald, of the Commerce Court, has been accused of improper conduct, and the judiciary committee of the House has decided to make an investigation. The committee has information on the subject which was gathered by agents of the Department of Justice and sent to the committee by President Taft. The charges have to do with alleged negotiations, conducted apparently some time ago, for the sale of culm at mines in Scranton. The allegation, so far as can be made out from the newspaper accounts, is that the property was bought from the Erie Railroad at a price unduly low, for the purpose or with the intention of selling it at a high price. The chairman of the committee, Senator Clayton, says that the following witnesses will be examined:

E. J. Williams, of Scranton, Pa., who is alleged to have negotiated for the purchase of the Erie coal piles for $3,000; B. H. Meyer, Interstate Commerce Commissioner, who first reported the charges against Judge Archbald to the President; G. F. Brownell, general attorney and vice-president of the Erie Railroad; W. P. Boland, president of the Marion Coal Company of Scranton, who first reported the alleged negotiations of Archbald and Williams; Capt. W. A. May, manager for the Erie Railroad of its coal properties, who is said to have been the Erie's principal in the alleged negotiations; Vice-President Charles C. Conn, of the Lackawanna & Wyoming Railroad, who charges that Judge Archbald and Williams offered to sell for $35,000 the coal properties which they are said to have bought from the Erie for $3,000. Special agents of the Department of Justice who investigated the charges will also be witnesses.

Members of Congress who have been dissatisfied with the decisions of the Commerce Court, reversing decisions of the Interstate Commerce Commission, have been agitating the question of abolishing the court, and the publication of charges against Judge Archbald looks as though it might be a part of this agitation. Mr. Archbald was appointed a judge of the federal court by President McKinley, in 1901, and was transferred to his present position on the establishment of the Commerce Court in December, 1910.

International Railway Fuel Association.

The fourth annual convention of the International Railway Fuel Association will be held May 22-25, at the Hotel Sherman, Chicago. On May 22 there will be addresses by President T. Duff Smith; by Robert Quayle (C. & N. W.); and by Walter S. Bogle, president of the Crescent Coal & Mining Company. On that day papers will be presented on Standard Locomotive Fuel Performance Sheet, by R. Collett (St. L. & S. F.), and on Fuel as a Factor in Locomotive Capacity, by Prof. W. F. M. Goss, University of Illinois. On May 23 papers will be presented on The Use of Anthracite Coal for Locomotive Fuel, by T. S. Lloyd (D. L. & W. and C. R. I & P.), and on Proper Method of Firing Locomotives, illustrated, by D. C. Buell (U. P.). On May 24 a paper on Locomotive Drafting and Its Relation to Fuel Consumption will be presented by H. B. MacFarland (A. T. & S. F.). On May 25 a paper will be presented on Inspection of Fuel from the Standpoint of the Producer and Consumer, by J. E. Hitt, Burnwell Coal Company, and Glenn Warner (C. H. & D.). On that day the reports of the committees will be received, which will be followed by the election of officers.

Railway Storekeepers' Association.

The ninth annual convention of the Railway Storekeepers' Association will be held May 20-22 at the Hotel Statler, Buffalo, N. Y. The regular subjects will include: Line Inspection, by J. H. Callaghan; How Can the Efficiency of the Store Department be Increased, by H. C. Pearce; Oil and Waste, by F. R. Brown; and Method of Handling and Accounting for Railroad Company Material Furnished for Repairs of Railroad Equipment at Contract Shops, by H. S. Burr. A number of papers on topical subjects will also be presented by members selected by the president. Reports will be received from the committee on recommended practices, the committee on piece work, the committee on scrap classification, the committee on accounting, the committee on the uniform grading of lumber, the committee on standard grain door, the committee on membership, the committee on stationery, and the committee on standardization of tin ware.

Air Brake Association.

The nineteenth annual convention of the Air Brake Association was held at the Jefferson Hotel, Richmond, Va., May 7-10. with an attendance of about 300 members. The convention was opened with prayer by Rev. George W. McDaniel, D.D., and addresses of welcome were made by Governor William Hodges Mann, for the commonwealth, and W. H. Adams, of the board of Aldermen, for the city. President T. M. Carrington, of the Chamber of Commerce extended the welcome of Richmond's business men. Responses for the delegates were made by M. J. Caples, fourth vice-president of the Chesapeake & Ohio, and by President W. P. Huntley, of the Air Brake Association.

New York Railroad Club.

At the next regular meeting of the New York Railroad Club, to be held May 17, a paper will be presented by W. H. Sauvage on Automatic Brake Slack Adjusters for Steam and Electric Cars, dealing with the question—What Relation Does a Slack Adjuster Bear to the Economy and Safety of Railways?

American Society of Mechanical Engineers.

At the meeting of the American Society of Mechanical Engineers to be held May 14, A. J. McFaul, of the Allen Advertising Company, New York, will introduce the subject of Commercial Dictating Machines. A general discussion will follow. The meeting will be followed by an informal dinner, provided a sufficient number subscribe.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.
AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomaston, Boston, Mass.; annual, May 10-11, San Francisco, Cal.
AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York; next convention, September 12, Seattle, Wash.
AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill.; annual, June 18-21, Detroit, Mich.
AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew building, Cincinnati, Ohio; 3d Friday of March and September.
AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York. Convention, October 7-11, Chicago.
AMERICAN ELECTRICAL RAILWAY MANUFACTURERS' ASSOC.—George Keegan, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.
AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York. Next session, May 15, New York.
AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Convention, 3d week in Oct., Baltimore, Md.
AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, Monadnock Block, Chicago.
AMERICAN RAILWAY MASTER MECHANICS' ASSOC.—J. W. Taylor, Old Colony building, Chicago. Convention, June 17-19, Atlantic City, N. J.
AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—M. H. Bray, N. Y. N. H. & H., New Haven, Conn. Convention, July 9, Chicago.
AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.
AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.
AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wemlinger, 13 Park Row, New York; 2d Tuesday of each month, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York; spring meeting, May 28-31, Cleveland, Ohio.
AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Convention, 3d week in January, 1913, Chicago.
ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; annual, June 26, 1912, Quebec, Que.
ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; annual convention, May 21-23, 1912, Los Angeles, Cal.
ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago. Semi-annual, June 11, Atlantic City, N. J.; annual, October 21-25, Chicago.
ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; annual, June 24, 1912, New York.
ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conrad, 75 Church St., New York. Convention, Oct. 7-11, Chicago.
CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.
CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal.
CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.
CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.
CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.
ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.
ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.
FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va.; annual, May 15, Buffalo, N. Y.
GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.
INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.
INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago. Convention, May 22-25, Chicago.
INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, Brown Marx building, Birmingham, Ala. Convention, July 23-26, Chicago.
INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Convention, August 15, Chicago.
MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; annual convention, May 14-17, Pittsburgh, Pa.
MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Annual convention, June 12-14, Atlantic City, N. J.
MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Convention, September 10-13, Denver, Col.
NATIONAL RAILWAY APPLIANCES ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.
NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.
NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.
NORTHERN RAILROAD CLUB.—C. L. Kennedy, C. M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.
OMAHA RAILWAY CLUB.—H. H. Maulick, Barker Block, Omaha, Neb.; second Wednesday.
PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria, Ill.; 2d Tuesday.
RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.
RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 2 Rector St., New York.
RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.
RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.
RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo.; next meeting, August 13-16, Roanoke, Va.
RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L., S. W. Ry., St. Louis, Mo.; annual, May 12, 1912, Kansas City, Mo.
RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa.
RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio. Convention, May 20-22, Buffalo, N. Y.
RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. assocs.
RAILWAY TEL. & TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.
RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.
ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. September 10-13, Buffalo, N. Y.
ST. LOUIS RAILWAY CLUB.—B. W. Fraumenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.
SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.
SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Niquist, La Salle St. Station, Chicago.
SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.
SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.
TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.
TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.
TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.
TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.
TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 18, 1912, Louisville, Ky.
TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.
TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.
TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.; annual, Aug. 27-30, Chicago.
WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.
WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.
WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month, except July and August, Chicago.

Traffic News.

The Erie Canal is to be opened for traffic May 15.

The Baltimore & Ohio is to establish a demonstration farm of 527 acres at Brown, Vinton County, Ohio.

Effective May 15 passenger fares from points east of the Missouri river to and through the state of Minnesota will be advanced on account of the advance in the Minnesota state fares from two to three cents a mile. The joint rate sheets containing these fares will be re-issued or supplemented.

In the United States district court at New York City last week H. R. Wakem, a shipping broker, and W. L. Divine, general import freight agent of the Chesapeake & Ohio, were indicted by the grand jury on a charge of illegal rebating. Wakem, acting for importers, shipped liquors and olive oil from New York to Chicago. The net amount collected for the transportation was less than the regular rate. It is charged that at first the railway company paid Wakem a salary of $150 a month, in lieu of rebates, and that thereafter he received a percentage, the total amount received in one year being $760.85.

Shippers Favored by Stenciled Tare Weights.

A. S. Dodge, superintendent of the Western Railway Weighing Association and Inspection Bureau, has submitted to the Interstate Commerce Commission, in connection with its investigation of railway weighing practices, a statement of the clean empty cars belonging to lines members of the association and weighed by association weighmasters during the year 1911 for the purpose of showing variations between the stenciled and actual tare weights. The statement is a substitute for one presented by Mr. Dodge at the recent hearing in Chicago covering the months of January, February, September, November and December, which showed that on 59 per cent. of the cars the stenciled tare was greater than the actual light weight and that the discrepancy operated to the shipper's advantage, whereas on 41 per cent. the stenciled tare was less than the actual weight, in which cases the discrepancy operated to the carrier's advantage.

The complete statement for the year shows that the advantage to the shippers from variations in car weights is even more pronounced when the entire year is taken into consideration. On 25,018 cars, or 73 per cent., the stenciled tare exceeded the actual tare by 25,213,624 lbs., an average of 1,008 lbs. per car. On 9,103 cars, or 26.7 per cent., the stenciled tare was less than the actual tare by 8,402,656 lbs., an average of 923 lbs. per car. Mr. Dodge's complete statement, giving the figures by months, as is follows:

Month.	Number of cars.	Stenciled tare greater than actual.	Average per car.	Number of cars.	Stenciled tare less than actual.	Average per car.
January	1,260	1,259,945	1,000	794	716,420	902
February	977	979,865	1,003	732	632,260	864
March	2,057	2,083,490	1,013	1,272	1,141,830	898
April	2,896	2,837,145	979	1,017	862,765	848
May	3,280	3,350,150	1,021	694	633,390	913
June	3,571	3,724,910	1,043	670	679,780	1,015
July	3,857	3,870,906	1,004	674	693,360	1,028
August	3,134	3,116,740	995	589	506,475	860
September	1,577	1,623,253	1,030	433	352,916	814
October	940	928,640	987	539	491,570	912
November	869	853,295	982	767	726,495	948
December	600	585,285	975	922	965,395	1,041
Total	25,018	25,213,624	1,008	9,103	8,402,656	923

Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association in presenting statistical bulletin No. 117-A, giving a summary of car surpluses and shortages by groups from December 21, 1910, to April 25, 1912, says:

"The total surplus on April 25, 1912, was 151,186 cars; on April 11, 1912, was 94,943 cars; on April 26, 1911, was 189,524 cars. Compared with the preceding period there is an increase of 52,243 cars, of which 1,967 are box, 1,173 flat, 45,892 coal, and 7,211 miscellaneous cars. The increase in box car surplus is general, except in group 10 (Oregon, Idaho, California, Arizona and Washington), where a decrease of 1,099 cars is shown, and

in groups 7 (Montana, Wyoming and Nebraska) and 11 (Canadian Lines), where no surplus is shown. The increase in coal car surplus is general throughout the country except in groups 9 (Texas Louisiana and New Mexico), where there is a slight decrease, and 11 (as above), where no surplus is shown. This increase is more noticeable, however, in groups 2 (New York, New Jersey, Delaware, Maryland and eastern Pennsylvania), 3 (Ohio, Indiana, Michigan and western Pennsylvania) and 5 (Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida), where the suspension of coal traffic has been a contributing factor.

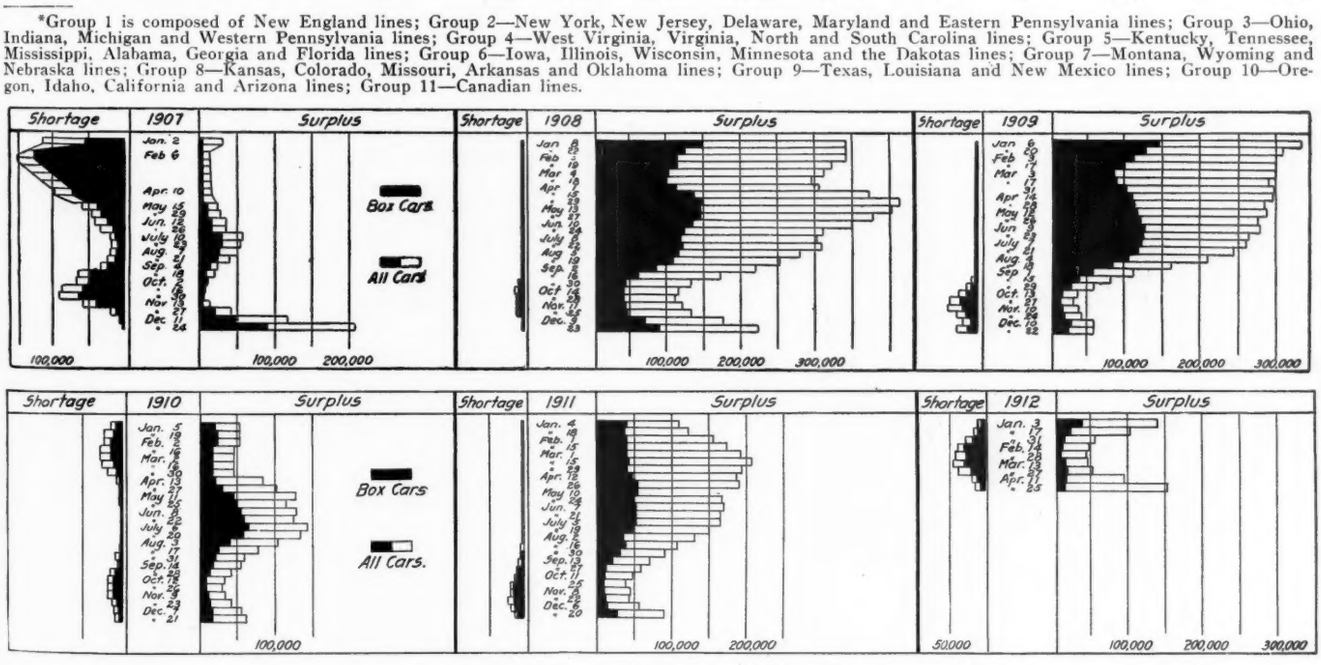
"The total shortage on April 25, 1912, was 12,305 cars; on April 11, 1912, was 15,554 cars; on April 26, 1911, was 2,518 cars. Compared with the preceding period there is a decrease of 3,494 box and 953 miscellaneous cars, but an increase of 276 flat and 922 coal cars, making a net decrease of 3,249 cars. The decrease in box car shortage is principally in groups 4 (the Virginias and Carolinas), 5 and 11 (see above), and there is a slight increase in group 6 (Iowa, Illinois, Wisconsin, Minnesota and the Dakotas). The decrease in coal car shortage is principally in groups 1 (New England Lines), 4 and 5 (as above). Compared with the same date of 1911 there is a decrease of 35,469 box, 2,716 flat and 9,494 miscellaneous cars, with an increase of 9,341 coal cars, making a net total decrease of 38,338 cars. There is an increase in total shortage of 9,787 cars, of which 6,061 is in box and 141 in coal cars."

The accompanying table gives car surplus and shortage figures by groups for the last period covered in the report, and the diagrams show total bi-weekly surpluses and shortages in 1907 to 1912.

CAR SURPLUSES AND SHORTAGES.

Date.	No. of roads.	Surpluses: Box.	Flat.	Coal gondola and hopper.	Other kinds.	Total.	Shortages: Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—April 25, 1912	7	957	1,041	2,419	211	4,628	54	165	305	3	527
" 2.— " 25, 1912	26	686	98	47,034	1,883	49,701	593	4	1,082	4	1,683
" 3.— " 25, 1912	23	1,199	1,957	23,215	7,392	33,763	130	200	20	1,707	2,057
" 4.— " 25, 1912	10	560	48	704	1,542	2,854	926	435	623	5	1,989
" 5.— " 25, 1912	20	1,251	85	6,192	1,371	8,899	729	230	100	0	1,059
" 6.— " 25, 1912	25	5,165	362	6,874	4,474	16,875	947	88	4	36	1,075
" 7.— " 25, 1912	3	0	65	443	611	1,119	74	0	10	2	86
" 8.— " 25, 1912	17	2,770	389	4,387	2,057	9,603	30	0	0	200	230
" 9.— " 25, 1912	10	1,530	245	172	1,008	2,955	0	0	0	25	25
" 10.— " 25, 1912	23	5,463	2,504	3,252	9,051	20,270	56	0	0	0	56
" 11.— " 25, 1912	5	2	63	0	454	519	2,613	491	0	414	3,518
Total	169	19,583	6,857	94,692	30,054	151,186	6,152	1,613	2,144	2,396	12,305

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin, Minnesota and the Dakotas lines; Group 7—Montana, Wyoming and Nebraska lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Oregon, Idaho, California and Arizona lines; Group 11—Canadian lines.



Car Surpluses and Shortages in 1907 to 1912.

Crop Conditions.

The crop reporting board of the department of agriculture estimates that on May 1 the area of winter wheat to be harvested was about 25,744,000 acres, or 3,418,000 acres (11.7 per cent.) less than the area harvested in 1911, and 6,469,000 acres (20.1 per cent.) less than the area sown last fall (32,213,000 acres).

The average condition of winter wheat on May 1 was 79.7, compared with 80.6 on April 1, 86.1 on May 1, 1911, and 85.2, the average for the past ten years on May 1. A condition of 79.7 per cent. on May 1 is indicative of a yield per acre of approximately 14.4 bu., assuming average variations to prevail thereafter. On the estimated area to be harvested, 14.4 bu. per acre would produce 370,714,000 bu., or 13.9 per cent. less than in 1911, 14.6 per cent. less than in 1910, and 11.3 per cent. less than in 1909. The out-turn of the crop will probably be above or below the figures given above, according as the change in conditions from May 1 to harvest is above or below the average change.

The average condition of rye on May 1 was 87.5, compared with 87.9 on April 1, 90.0 on May 1, 1911, and 89.2, the average for the past ten years on May 1. Details for winter wheat and rye states follow:

States.	Winter Wheat: Per cent. abandoned.	Acres remaining to be harvested.	Condition May 1, 1912.	1911.	10-yr. av.	Rye. Condition May 1, 1912.	1911.	10-yr. av.
Kansas	18.0	5,361,000	80	76	80	88	77	86
Nebraska	10.5	2,856,000	85	88	87	92	87	90
Illinois	53.5	1,183,000	52	86	86	77	93	92
Missouri	23.2	1,930,000	72	92	87	83	94	90
Indiana	46.5	1,206,000	52	90	83	75	92	89
Ohio	45.2	1,192,000	53	88	82	75	89	86
Oklahoma	10.5	1,522,000	87	67	82	90	74	83
Pennsylvania	4.6	1,240,000	89	89	89	88	90	90
Washington	4.5	988,000	95	96	91	95	97	95
Michigan	26.0	705,000	64	91	83	79	92	88
Kentucky	13.0	686,000	76	92	87	79	93	88
Virginia	2.8	741,000	92	89	88	93	90	88
Texas	1.5	704,000	93	83	77	94	91	76

States.	Winter Wheat—(Continued). Per cent. abandoned.	Acres remaining to be harvested.	Condition May 1, 1912.	1911.	10-yr. av.	Rye. Condition May 1, 1912.	1911.	10-yr. av.
Tennessee	5.6	667,000	85	88	86	86	88	87
Oregon	1.6	630,000	100	94	95	98	96	95
N. Carolina	3.3	598,000	91	90	86	90	89	89
Maryland	3.0	598,000	93	85	89	92	86	90
California	8.0	385,000	77	83	85	90	90	88
New York	5.1	335,000	83	89	87	88	85	89
Idaho	3.8	340,000	96	96	95	98	93	97
Iowa	18.3	279,000	84	93	90	91	95	94
Montana	3.7	291,000	95	98	..	96	95	96
West Virginia	3.3	233,000	90	88	86	92	91	89
Colorado	7.8	193,000	88	85	..	90	82	91
Utah	7.1	156,000	95	92	..	95	97	97
Georgia	5.0	135,000	85	91	86	87	90	88
Delaware	3.9	111,000	91	87	89	90	90	89
Arkansas	7.0	94,000	81	88	86	86	89	87
Wisconsin	7.2	87,000	89	88	88	91	91	91
New Jersey	5.7	79,000	88	90	88	91	91	92
S. Carolina	4.3	79,000	84	85	84	85	88	87
New Mexico	10.9	37,000	83	89	..	..	81	..
Alabama	7.0	30,000	83	90	88	85	86	86
Wyoming	8.7	28,000	92	92	..	96	95	96
Arizona	15.0	21,000	96	..	..	..	..	..
Nevada	5.0	16,000	94	100	..	..	98	..
Mississippi	17.0	8,000	83	85	86	..	..	..
Minnesota	....	.....	..	..	..	94	89	89
North Dakota	....	.....	..	..	..	88	87	86
South Dakota	....	.....	..	..	..	94	90	92
Connecticut	....	.....	..	..	..	92	89	94
Massachusetts	....	.....	..	..	..	94	84	91
Vermont	....	.....	..	..	..	90	86	92
United States.	20.1	25,744,000	79.7	86.1	85.2	87.5	90.0	89.2

The average condition of meadow (hay) lands on May 1 was 85.7, compared with 84.7 on May 1, 1911, and a ten-year average on May 1 of 88.6.

Stocks of hay on farms May 1 are estimated as 3,888,000 tons (8.2 per cent. of crop), against 7,546,000 tons (12.4 per cent.) on May 1, 1911.

INTERSTATE COMMERCE COMMISSION.

The Southwestern Missouri Millers' Club has complained to the Interstate Commerce Commission against the present rules of the railways which provide that when shippers make repairs to car doors to permit shipment of grain they shall be allowed 80 cents per car, and when they put on new doors they shall be allowed $1.20 per car. The St. Louis & San Francisco, Atchison, Topeka & Santa Fe, Missouri & Pacific, and St. Louis, Iron Mountain & Southern are named as defendants.

In line with the views expressed by the commission in the so-called commutation rate case, decided on June 21, 1911, a new schedule of 60-trip monthly fares has now been submitted by the Erie, which the commission has accepted as conforming to the findings in that case. On what it considers good grounds the commission concludes that the 50-trip fares of that line need not now be revised, and also permits both the 60-trip and 50-trip fares of the West Shore to remain undisturbed for the present.

Reparation Awarded.

Standard Oil Co. v. Illinois Terminal Railway Co. et al. Opinion by the commission:

The complainant alleges that the switching rate at St. Louis of two cents per 100 lbs. on an arbitrary weight of 7.4 lbs. per gallon on oil was excessive and that a rate of one cent per 100 lbs., based on an estimated weight aggregating 7,867,837 lbs., should have been charged. The charges were based on an estimated weight of 7.4 lbs. per gallon, provided in the western classification, which, however, did not govern the movements. The commission decided that the rate charged by the defendants was excessive, in that it exceeded a rate of two cents per 100 lbs. on a total weight of 7,867,837 lbs. (23 I. C. C., 369.)

Switching Charge Found Reasonable.

Curtis Brothers & Co. v. Southern Pacific et al. Opinion by the commission:

Previous to October 5, 1910, the Southern Pacific had performed free of switching charge the service of handling cars in and out of the complainants' plant, using a portion of the McCloud River railway to get to the plant. On October 5 the McCloud River Company filed a tariff providing for a charge of $3 per car for this service and refused to permit the Southern Pacific to continue to perform the service. Although this has the effect of increasing the rate to the complainant, the commission does not find that it comes under the class of increases in rates where the burden of proof is placed on the railway to justify the increase. The switching charge itself is not found to be unreasonable, and the Southern Pacific's rate is not unreasonable. The complaint is therefore dismissed. (32 I. C. C., 372.)

Water Competition Controls.

Michael Cohen & Co. v. Mallory Steamship Co. et al. Opinion by the commission:

A shipment of rough marble was made from New York to San Francisco via Galveston, Tex. The bill of lading prepared by the complainant described the shipment as rough stone, on which a rate of 55 cents applied. At destination the rate on rough marble was applied, and the complaint is that rates on rough marble are unreasonable and should be no higher than rates on rough stone. The 55 cent rate on rough stone is made only so as to meet competition by the all-water route around Cape Horn, which competition does not apply on marble because of the greater value of the marble, and consequent greater risk of carriage by way of Cape Horn. The commission recognizes the force of this argument and holds that a rate of 95 cents per 100 lbs. on marble from New York to San Francisco is reasonable. (23 I. C. C., 374.)

Rate on Malt Reduced.

Electric Malting Co. v. Atchison, Topeka & Santa Fe et al. Opinion by the commission:

There is at present a rate higher by 10 cents per 100 lbs. on malt than on barley from Minneapolis, Minn., to California terminals. The complainants claim that they have to compete with manufacturers of malt in Californian cities under a great disadvantage, because they have to pay 10 cents more per 100 lbs. on their malt than the competitors have to pay on their barley from which malt is made. Malt is worth on the average 50 per cent. more than barley, and 100 lbs. of barley makes 80 lbs. of malt. The commission recognizes the fact that a higher rate may be charged for a manufactured product than the raw material, and finds that 7 cents instead of 10 cents is the proper difference between the barley rate and the malt rate. No reparation is awarded. (23 I. C. C., 378.)

Boat Line a Private Facility of Salt Company.

Colonial Salt Co. et al. v. Michigan, Indiana & Illinois Line et al. Opinion by Commissioner Harlan:

In 1900 large salt interests in Michigan organized the Michigan, Indiana & Illinois Line under the laws of Illinois. Immediately the railways established joint through rates with this boat line to its various destinations. The boat line was claimed to be a common carrier, but the complainants allege that it was a private facility of the salt company, formed to evade the law and secure rebates on salt. It was claimed that the establishment of this line had destroyed the parity of the salt rates in that district and had enabled the salt company, which owned the boat line, to place its product on the market at much lower rates than was possible to the competing salt companies. It was shown that the boat line received divisions of from 30 to 35 per cent. of the through rates, so that where the salt company had been previously paying seven or eight cents a barrel to land its salt across Lake Michigan, the boat line now was receiving from 16 to 18 cents a barrel out of the joint through rates. The boat line, having no terminals at Chicago, rented the facilities of the parent salt company and agreed to furnish labor necessary to perform the terminal service at that point; therefore, the salt company was relieved of the expenses, incident to services received other than transportation, which it had previously been obliged to meet. It was also shown that the boat line only published tariffs for salt in cargo lots and that out of its own earnings enormous returns were paid to the salt company. The commission decided that the boat line was not a common carrier but was a private facility of the Morton Salt Company. The same was found regarding the Ludington Transportation Company, owned by the Ludington Salt Company. The commission decided that these relations were unlawful and should be discontinued. No order was made. (23 I. C. C., 358.)

STATE COMMISSIONS.

INDIANA.—See block signal order, under the head of signaling.

The Indiana railway commission has postponed from May 1 to June 15 the effective date of its order reducing express rates within the state by about 15 per cent. This was suggested by Judge Anderson of the federal court at Indianapolis during the hearing on a motion by the six express companies for a temporary injunction to set aside the order of the commission, on the ground that by June 15 the Interstate Commerce Commission may issue an order affecting express rates throughout the country.

The Galveston, Houston & Henderson, which runs from Houston to Galveston and is used jointly by the Missouri, Kansas & Texas and the International & Great Northern, has asked the Texas railway commission to make a revaluation of its property. In 1885 the company issued $1,000,000 stock and $2,000,000 bonds, the bonds maturing in 1912. The Texas railway commission's valuation of the property for the purpose of bond issue made in 1895 placed the amount of bonds issuable at $1,527,023.

A. S. Goodeve, of Rossland, British Columbia, has been appointed to fill the long-existing vacancy on the Railway Commission of Canada caused by the death of Hon. Thomas Greenway. Mr. Goodeve is member of Parliament for Kootenay, and assistant chief conservative whip. He will represent the West on the commission. He has been a careful student of transportation problems. He was born at Guelph, Ont., in 1860, but went West in early life, locating at Rossland. He was Mayor of that town in 1889 and 1890 and was Provincial Secretary in 1902.

The New York Public Service Commission, Second district, has ordered a hearing on May 20 upon the complaint of the Postal Telegraph-Cable Company, made against the New York Telephone Company, alleging that the telephone company is, by illegal discrimination, diverting to the Western Union Telegraph Company telegrams which are intended for the Postal Telegraph-Cable Company. It appears that the telephone company connects callers with the Western Union Telegraph Company, when either "Western Union," its telephone number or merely "telegram" is asked for, and that it is only when "Postal" or its telephone number is asked for that callers are connected with the Postal Telegraph-Cable Company.

The Washington public service commission has rendered a decision in the case of the Central Mill Company against the Northern Pacific in which it is held that the present practice of the railway in charging lower rates on shipments of ten cars or more of logs than on single carloads, is an unjust discrimination against the smaller manufacturer. The railway is ordered to establish rates on shipments of less than ten cars which shall not exceed the rate for shipments of ten or more cars by more than ten cents per 1,000 ft. In addition, the commission ordered that the minimum in either case shall be between 6,000 and 7,000 ft. The complaint alleged that the rate on logs from Buckley to Tacoma in shipments of ten cars or more was $1 per 1,000 ft., with a minimum of 5,500 ft., while on shipments of less than ten cars the rate was $1.45 per 1,000 ft., with a minimum of 7,000 ft.

COURT NEWS.

Supreme Court Justice Erlanger has granted an order to show cause why the New York Central should not be restrained from transferring or assigning any capital stock of the Rutland to the New York, New Haven & Hartford. The order, which is also directed against the New Haven and Rutland, was granted on behalf of Tomkins C. Delavan, John F. Calder, Ralph L. Shainwald and George N. Towle, minority stockholders in the Rutland.

In the United States district court in Chicago, May 7, the railways recently indicted for giving rebates in the guise of payments for advertising pleaded guilty, and Judge Carpenter imposed fines as follows: Cleveland, Cincinnati, Chicago & St. Louis (two indictments), $20,000; Lake Shore & Michigan Southern, $10,000; Michigan Central, $10,000. Indictments against railway traffic officers were non-suited, by agreement of counsel. The cases against theatrical agents are still pending. The indictments on which these fines were imposed charged conspiracy to violate section 6 of the interstate commerce law.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF FEBRUARY, 1912. (SEE ALSO ISSUES OF APRIL 5, 12, AND 19.)

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses					Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total, inc. misc.	Maintenance Way and structures.	Maintenance Of equipment.	Traffic.	Transportation.	General.	Total.					
Belt Ry. Co. of Chicago	21	.....	.....	$204,080	$12,881	$23,448	$509	$97,543	$4,246	$138,627	$65,453	.....	$6,250	$59,203	$9,159
Butte, Anaconda & Pacific	46	$84,970	$6,293	96,100	7,775	19,037	759	44,953	2,349	74,873	21,227	.....	2,000	19,227	19,310
Chicago Great Western	1,496	739,055	180,038	1,001,400	96,536	169,725	49,148	499,604	37,032	852,045	149,355	—$501	33,489	115,365	—36,006
International & Great Northern	1,159	615,679	157,972	831,494	125,322	115,817	26,413	363,394	34,917	666,063	165,431	—380	22,000	143,051	.....
Kanawha & Michigan	177[1]	167,633	23,471	195,875	19,416	39,076	2,285	68,052	5,792	134,621	61,254	—10	8,186	53,058	—5,749
Kansas City, Mexico & Orient	868[2]	96,481	28,238	132,959	55,554	23,833	5,591	65,102	13,774	163,854	—30,895	.....	7,750	—38,645	—28,186
Louisiana Ry. & Navigation	351	104,793	22,471	137,355	30,391	16,052	6,360	61,975	6,119	120,897	16,458	.....	5,000	11,458	4,137
Minneapolis, St. Paul & S. Ste. Marie	3,770[3]	1,357,852	299,303	1,766,590	167,271	277,659	44,915	720,176	45,580	1,255,601	510,989	—2,415	104,668	403,906	161,529
Nashville, Chattanooga & St. Louis	1,230[4]	701,900	217,821	989,026	125,129	177,698	41,373	376,731	26,724	747,655	241,371	—464	27,794	213,113	—40,133
New Orleans, Texas & Mexico	277[5]	134,328	18,793	161,780	32,990	19,442	5,229	65,752	8,347	131,760	30,020	.....	.....	30,020	26,114
Spokane, Portland & Seattle	551[6]	206,511	129,839	358,576	37,960	41,313	7,667	96,051	12,299	195,290	163,286	—137	53,400	109,749	—13,183
Ulster & Delaware	129	34,120	11,764	48,828	8,596	13,694	958	26,849	2,499	52,596	—3,768	62	3,300	—7,006	2,492
EIGHT MONTHS OF FISCAL YEAR, 1912.															
Belt Ry. Co. of Chicago	21	.....	.....	$1,751,422	$110,441	$198,069	$4,763	$679,674	$44,877	$1,037,824	$713,598	.....	$57,559	$656,039	$39,876
Butte, Anaconda & Pacific	46	$630,681	$70,742	748,841	78,882	140,011	5,572	336,628	22,210	583,303	165,538	.....	17,764	147,774	11,961
Chicago Great Western	1,496	5,960,870	1,992,076	8,624,659	975,682	1,286,789	376,862	3,646,556	279,676	6,565,565	2,059,094	—$368	264,748	1,793,978	—128,509
International & Great Northern	1,159[7]	4,125,162	1,072,418	5,529,307	540,502	612,542	128,557	2,043,287	173,835	3,498,723	2,030,584	—1,879	170,500	1,858,205	.....
Kanawha & Michigan	177[1]	1,881,144	235,009	2,158,260	250,115	361,736	17,917	647,458	52,459	1,329,685	828,575	13	70,935	757,653	—41,069
Kansas City, Mexico & Orient	868[2]	900,819	247,289	1,215,801	325,428	235,745	63,724	560,419	76,037	1,261,353	—45,552	.....	47,437	—92,989	—127,907
Louisiana Ry. & Navigation	351	989,930	190,520	1,273,990	193,112	115,899	48,684	495,912	54,365	907,972	366,018	.....	38,200	327,818	113,511
Minneapolis, St. Paul & S. Ste. Marie	3,770[3]	12,373,170	3,850,315	17,215,944	1,676,897	2,205,165	357,902	5,659,172	360,860	10,259,996	6,955,948	85,913	1,048,755	5,993,106	1,715,354
Nashville, Chattanooga & St. Louis	1,230[4]	5,481,797	2,003,046	8,046,738	1,199,878	1,489,401	301,677	2,956,251	203,239	6,150,446	1,896,292	—7,846	194,506	1,693,940	179,952
New Orleans, Texas & Mexico	277[5]	807,705	151,177	1,020,485	202,260	118,770	34,583	445,151	55,909	860,673	159,812	.....	3,474	156,338	31,519
Spokane, Portland & Seattle	551[6]	1,877,701	1,179,151	3,264,853	328,582	306,288	57,000	833,343	89,850	1,615,063	1,649,790	9,976	313,805	345,961	91,414
Ulster & Delaware	129	423,527	271,748	730,529	100,883	89,657	11,122	300,904	20,055	522,621	207,908	734	26,400	182,242	—11,470

Operated in the preceding period—[1] 176; [2] 740; [3] 3,764; [4] 1,255; [5] 264; [6] 433. — Indicates Deficits, Losses and Decreases.
[7] Figures shown here are for the period September 16 to February 29.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF MARCH, 1912.

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total, inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Alabama & Vicksburg	143	$88,976	$33,268	$131,264	$19,437	$25,953	$3,766	$50,682	$5,263	$105,101	$26,163	—$2,311	$4,200	$19,652	—$12,799
Alabama Great Southern	309	286,371	81,251	401,436	49,849	81,144	11,462	136,299	9,672	288,426	13,010	—492	13,935	98,583	62,826
Atchison, Topeka & Santa Fe	8,201[1]	4,753,241	1,894,303	7,543,636	954,159	1,183,362	185,869	2,401,680	159,942	4,885,012	2,658,624	.....	312,652	2,345,972	—338,292
Atlanta & West Point	93	68,270	35,407	113,426	11,024	20,414	4,571	35,932	4,116	76,057	37,369	235	5,189	32,415	482
Atlantic & St. Lawrence	167	115,750	25,615	154,230	10,107	22,968	4,699	97,271	4,130	139,175	15,055	.....	6,658	8,397	—646
Atlantic Coast Line	4,527[2]	2,171,519	855,646	3,259,802	401,185	453,154	49,988	1,104,011	74,403	2,082,691	1,177,111	.....	115,000	1,062,111	—284,929
Baltimore & Ohio—System	4,433[3]	5,663,755	1,072,420	8,142,297	848,187	1,492,078	161,545	2,940,900	167,535	5,610,245	2,532,052	—55,643	236,572	2,237,837	224,825
Bangor & Aroostook	627	274,796	47,596	336,499	38,491	35,356	4,530	101,349	10,968	190,694	145,805	.....	10,375	135,430	8,615
Boston & Maine	2,244[4]	2,335,366	1,106,930	3,727,351	404,861	645,608	38,042	2,060,150	96,248	3,244,909	482,442	9,110	174,301	317,251	116,345
Buffalo & Susquehanna *R. R.*	265	153,292	7,412	164,992	25,780	34,541	1,506	63,930	6,274	132,031	32,961	.....	2,600	30,361	—7,641
Buffalo & Susquehanna *Ry.*	91	44,962	6,990	53,908	18,466	29,239	444	24,951	2,346	75,446	—21,538	—9	1,400	—22,947	—6,754
Buffalo, Rochester & Pittsburgh	572	727,872	71,488	819,541	87,723	164,692	10,763	281,817	16,767	561,762	257,779	—511	17,000	240,268	60,639
Canadian Pacific Lines in Maine	233	126,831	49,726	185,204	17,839	21,969	4,941	112,051	3,614	160,414	24,790	.....	7,000	17,790	—36,285
Carolina, Clinchfield & Ohio	238[5]	169,718	10,138	183,306	16,179	18,186	6,882	35,613	7,160	84,020	99,286	1,138	8,000	92,424	26,751
Carolina, Clinchfield & Ohio of S. C.	18	11,984	1,385	13,537	1,668	100	961	2,534	422	5,685	7,852	.....	500	7,352	1,438
Central of Georgia	1,915	894,450	275,575	1,279,033	158,244	212,667	35,321	448,665	38,195	893,092	385,941	5,286	54,100	337,127	—28,151
Central of New Jersey	672[6]	1,998,900	384,127	2,519,582	168,744	326,661	26,003	743,355	41,123	1,305,886	1,213,696	—18,418	94,445	1,100,833	259,978
Central New England	277	299,325	23,998	337,880	16,565	24,516	1,229	94,263	2,085	138,658	199,222	—139	9,000	190,083	94,718
Charleston & Western Carolina	341	144,110	24,189	176,192	30,536	26,457	2,709	67,746	4,534	131,982	44,210	.....	5,000	39,210	—25,609
Chicago & Alton	1,025	896,237	293,348	1,281,365	105,561	262,146	39,402	508,880	33,961	949,950	331,415	—3,856	43,500	284,059	—76,009
Chicago & Eastern Illinois	1,275	1,077,433	220,828	1,406,379	107,546	277,815	32,386	565,846	39,411	1,023,004	383,375	—1,816	37,500	344,059	14,923
Chicago & Northwestern	7,951[7]	3,854,170	1,384,705	5,845,116	532,494	768,893	100,632	2,702,657	123,351	4,228,027	1,617,089	—14,597	305,000	1,297,492	—329,166
Chicago, Burlington & Quincy	9,074[8]	5,166,621	1,411,473	7,211,044	715,817	1,294,780	131,312	2,789,140	191,554	5,122,603	2,088,441	—10,866	265,015	1,812,560	—309,322
Chicago, Indiana & Southern	359[9]	393,532	20,112	424,989	45,177	105,670	7,382	149,972	8,866	317,067	107,922	106	13,000	95,028	59,311
Chicago, Milwaukee & Puget Sound	2,059[10]	1,108,870	171,980	1,317,504	89,719	146,338	43,010	458,111	20,081	757,259	560,245	—43,794	75,787	440,664	—184,907
Chicago, Milwaukee & St. Paul	7,511[11]	3,806,550	985,722	5,300,658	387,212	854,746	101,560	2,425,760	94,351	3,863,629	1,437,029	34,026	229,685	1,241,370	—308,928
Chicago, Peoria & St. Louis	255	117,814	23,705	148,341	17,978	25,798	6,898	74,388	5,789	130,851	17,490	.....	4,300	13,190	—1,354
Chicago, Rock Island & Gulf	477[12]	154,011	40,921	211,928	29,643	24,971	10,004	96,966	7,727	169,311	42,617	—307	8,122	34,188	—27,239
Chicago, Rock Island & Pacific	7,565[13]	3,228,096	1,224,348	4,777,605	491,829	617,771	161,759	2,346,004	134,884	3,752,247	1,025,358	—17,598	225,572	782,188	—348,680
Chicago, St. Paul, Minneapolis & Omaha	1,744	822,966	322,122	1,226,497	87,667	163,795	23,249	601,935	30,564	907,210	319,287	—2,142	62,232	254,913	—167,597
Cincinnati, Hamilton & Dayton	1,015	585,571	105,795	764,909	85,104	148,764	20,717	345,376	17,291	617,252	147,657	.....	24,689	122,968	7,521
Cincinnati Northern	245[14]	96,811	14,522	116,035	17,867	30,385	2,544	64,613	3,378	118,787	—2,752	.....	5,300	—8,052	—16,227
Cleveland, Cincinnati, Chic. & St. Louis	2,012[15]	1,953,246	545,408	2,720,370	262,588	459,702	65,631	1,141,419	53,119	1,982,459	737,911	—3,692	95,000	639,219	130,350
Colorado Midland	338	90,310	14,531	115,887	15,861	27,366	6,626	64,690	5,198	119,741	—3,854	—1,078	8,000	—12,932	—4,500
Colorado & Southern	1,075[16]	501,584	79,884	626,240	70,044	136,495	15,110	236,859	22,724	481,232	145,008	—1,701	29,200	114,107	—58,330
Cumberland Valley	162	201,901	47,244	259,978	40,570	33,996	3,808	86,017	8,185	172,576	87,402	161	5,612	81,951	64,822
Delaware & Hudson Co.—R. R. Dept.	854[17]	1,529,419	187,970	1,772,363	164,564	277,702	20,882	684,837	52,579	1,200,564	571,799	20,807	48,739	543,867	—93,354
Delaware, Lackawanna & Western	958[18]	2,237,948	515,675	2,932,445	250,705	567,766	63,377	970,520	59,660	1,912,028	1,020,417	59,647	168,940	911,124	—44,174
Denver & Rio Grande	2,545	1,338,713	300,798	1,717,731	234,335	382,857	50,083	645,909	52,705	1,365,919	351,812	—2,681	78,000	271,131	—82,803
Denver, Northwestern & Pacific	215	62,507	8,707	75,492	17,145	15,127	1,918	34,273	3,740	72,203	3,289	.....	3,500	—211	153
Detroit & Mackinac	358[19]	78,602	23,359	107,954	8,151	17,759	2,314	36,782	3,080	68,086	39,868	—140	8,250	31,478	6,817
Detroit, Grand Haven & Milwaukee	191	100,000	41,500	164,300	15,826	23,787	5,148	106,933	4,254	155,948	8,352	—14	2,880	5,458	—5,054
Detroit, Toledo & Ironton	441	140,877	10,531	161,074	25,795	16,091	2,710	83,387	5,447	133,430	27,644	11	5,000	22,633	13,715
Duluth & Iron Range	200[20]	83,185	23,173	114,401	28,968	45,010	785	64,697	8,716	148,176	—33,775	—3,374	4,559	—41,708	—19,593
Duluth, Missabe & Northern	342[21]	169,681	34,279	209,260	43,224	58,749	1,667	80,779	11,119	195,538	13,722	—2,384	8,402	2,936	—131,205
El Paso & Southwestern Co.	902	532,018	79,828	641,662	85,571	93,174	12,667	185,339	23,241	399,992	241,670	—1,592	22,238	217,840	10,675
Elgin, Joliet & Eastern	841[22]	931,313	5	986,215	71,917	141,949	4,161	310,313	14,315	542,655	443,560	.....	23,555	420,005	162,936
Erie	1,995	3,201,149	655,222	4,168,157	332,263	774,051	95,620	1,557,123	90,779	2,849,836	1,318,321	—61,177	163,026	1,094,118	—177,377
Florida East Coast	630[23]	222,914	295,830	586,934	57,482	45,505	10,299	197,278	16,574	327,138	259,796	—700	15,500	243,596	—151,940
Fort Worth & Denver City	454	240,899	88,823	350,305	50,184	74,895	6,541	140,849	14,542	287,011	63,294	—513	10,292	52,489	—31,187
Galveston, Harrisburg & San Antonio	1,338	594,980	243,846	890,249	102,204	186,701	36,623	409,697	30,014	765,239	125,010	—7,391	35,404	82,215	—121,705
Georgia	307	210,877	70,916	302,066	28,999	49,962	11,766	139,445	8,596	238,768	63,298	.....	2,920	60,378	—24,381
Georgia Southern & Florida	395	128,854	65,100	223,604	26,447	43,587	7,458	88,444	9,713	175,649	47,955	.....	9,819	38,136	—3,129
Grand Rapids & Indiana	586[24]	320,941	115,717	467,545	51,441	77,553	11,304	212,339	14,340	366,987	100,558	—787	23,365	76,406	—2,187
Grand Trunk Western	347	369,000	138,000	540,710	58,806	78,141	17,406	265,361	14,157	433,871	106,839	—1,842	31,635	73,362	—16,184
Great Northern	7,345[25]	3,507,919	956,241	4,847,167	488,750	708,385	84,654	1,535,834	92,573	2,910,196	1,936,971	—4,993	274,330	1,657,648	340,877
Gulf & Ship Island	307	120,227	29,256	160,547	19,016	31,095	2,169	53,225	8,902	114,407	46,140	.....	5,220	40,920	—15,753
Gulf, Colorado & Santa Fe	1,597[26]	627,322	197,099	888,977	132,458	169,236	28,792	422,117	37,154	789,757	99,220	.....	42,929	56,291	30,701
Illinois Central	4,755[27]	3,487,481	995,516	5,145,961	453,219	1,172,479	121,650	2,176,053	121,361	4,044,762	1,101,199	—11,273	210,279	879,647	—251,922
Indiana Harbor Belt	105[28]	.....	.....	266,381	22,268	31,008	2,915	117,588	6,790	180,569	85,812	442	5,000	81,254	37,080
Kansas City Southern	827	530,068	118,076	734,481	93,012	103,847	26,519	303,213	33,797	560,388	174,093	.....	30,160	143,933	—132,649
Lake Erie & Western	886	404,354	63,899	490,905	62,797	93,347	10,110	199,406	10,961	376,621	114,284	.....	19,000	95,284	36,284
Lake Shore & Michigan Southern	1,775[29]	3,302,270	805,033	4,609,513	421,930	690,057	80,120	1,608,997	100,477	2,901,581	1,707,932	—5,865	140,000	1,562,067	617,361
Lehigh & Hudson River	97	161,783	3,454	166,468	11,335	22,825	1,415	59,237	4,583	99,395	67,073	.....	3,500	63,573	27,629
Lehigh Valley	1,450[30]	2,958,479	299,174	3,364,546	300,803	608,381	84,905	1,175,714	71,763	2,241,566	1,122,980	—23,353	131,000	968,627	—55,969
Long Island	399[31]	303,532	422,161	757,849	109,906	109,290	9,957	414,139	24,101	667,393	90,456	24,010	56,450	58,016	28,310

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF MARCH, 1912—(CONTINUED).

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total, inc. misc.	Maintenance: Way and structures.	Maintenance: Of equipment.	Traffic.	Transportation.	General.	Total.					
Louisiana & Arkansas	255	117,018	14,826	137,009	15,688	19,938	2,609	36,652	3,703	78,590	58,419	.....	4,233	54,186	3,309
Louisiana Western	208	115,483	51,406	176,568	16,179	31,923	7,577	62,772	6,031	124,482	52,086	705	6,534	46,257	—22,319
Louisville & Nashville	4,722[32]	3,689,348	963,411	4,939,330	739,586	892,479	118,979	1,695,045	100,979	3,547,068	1,392,262	—10,687	150,617	1,230,958	—216,725
Louisville, Henderson & St. Louis	200	75,184	28,578	110,031	22,250	15,459	4,201	39,897	2,812	84,619	25,412	61	3,000	22,473	8,923
Maine Central	1,204[33]	638,440	227,057	913,165	89,426	135,573	8,412	376,954	21,812	632,177	280,988	—5,249	42,897	232,842	36,785
Michigan Central	1,817[34]	1,909,567	545,831	2,719,337	232,347	383,820	60,946	1,146,432	49,083	1,872,628	846,709	—435	116,000	730,274	363,654
Midland Valley	373[35]	71,961	35,579	114,870	22,361	15,642	2,770	36,742	6,856	84,371	30,499	—185	5,785	24,529	—10,308
Missouri, Kansas & Texas	1,744[36]	851,618	297,339	1,233,125	129,629	214,179	35,761	487,368	39,834	906,771	326,354	—2,915	52,000	271,439	—99,427
Missouri Pacific	3,915[37]	1,292,178	304,799	1,751,095	245,245	232,896	59,295	971,720	78,062	1,587,218	163,877	—2,182	103,000	58,695	—138,703
Mobile & Ohio	1,114	812,260	107,823	978,164	108,418	190,176	35,443	364,079	33,201	731,317	246,847	—856	27,483	218,508	—71,782
Monongahela	65	130,829	2,194	134,738	14,601	18,321	307	25,738	2,047	61,014	73,724	.....	2,000	71,234	11,098
Morgan's La. & Tex. R. R. & S. S. Co.	404	260,531	94,217	383,018	56,559	50,878	13,278	172,958	11,358	305,031	77,987	—1,506	17,763	58,718	—6,755
Nashville, Chattanooga & St. Louis	1,230[38]	751,003	219,208	1,041,417	143,047	187,919	44,833	404,624	28,743	809,166	232,251	—527	27,794	203,930	—36,487
Nevada Northern	165	120,949	11,678	135,769	14,956	14,572	371	29,023	3,429	62,351	73,418	.....	5,724	67,694	16,813
New Orleans & North Eastern	196	252,129	47,873	325,090	31,382	59,855	9,465	133,318	12,978	246,998	78,092	—315	8,250	69,527	—21,993
New Orleans Great Northern	282	94,793	25,077	129,419	18,712	17,413	2,392	40,761	8,439	87,717	41,702	—40	124	41,538	—9,867
New York Central & Hudson River	3,597[39]	5,639,031	2,251,911	8,852,174	964,350	1,703,409	203,906	3,637,085	222,967	6,731,717	2,120,457	7,146	462,210	1,665,393	169,764
New York, Chicago & St. Louis	562	901,200	84,519	1,026,987	90,071	106,089	43,320	475,303	16,895	731,678	295,309	—2,695	32,000	260,614	62,081
New York, New Haven & Hartford	2,092[40]	3,066,763	1,956,982	5,476,408	411,590	677,511	29,782	2,289,410	160,873	3,569,166	1,907,242	102,988	340,000	1,670,230	376,263
New York, Ontario & Western	566[41]	643,245	88,003	755,777	91,430	135,038	8,607	332,750	17,564	583,389	170,388	—3,130	17,917	149,341	4,999
New York, Philadelphia & Norfolk	112	208,201	29,894	256,662	22,703	47,132	4,042	107,385	12,470	193,732	62,930	.....	7,900	55,030	7,410
Norfolk & Western	2,014[42]	2,845,648	315,724	3,270,707	364,182	687,358	57,413	1,030,898	63,360	2,203,211	1,067,496	—2,159	120,000	945,337	—20,269
Norfolk Southern	608	213,557	55,939	286,663	33,500	33,629	5,127	91,622	13,524	177,402	109,261	—182	7,500	101,579	—8,267
Northern Central	473[43]	904,623	169,011	1,134,764	148,467	245,099	14,453	538,022	28,482	974,523	160,241	237	36,175	124,303	—8,868
Northern Pacific	6,032[44]	3,558,470	1,040,253	4,928,944	369,556	668,972	102,056	1,759,780	74,386	2,974,750	1,954,194	—2,965	295,737	1,655,492	—26,103
Oregon Short Line	1,762[45]	1,129,512	294,744	1,527,687	169,147	167,254	26,879	422,984	34,594	820,858	706,829	—2,407	57,000	647,422	81,289
Oregon-Washington R. R. & Nav. Co.	1,920[46]	800,558	338,201	1,233,838	184,037	154,153	42,576	493,488	51,703	925,957	307,881	—6,817	70,580	230,484	—40,687
Pecos & Northern Texas	479[47]	149,818	34,742	195,535	23,561	41,444	3,024	79,277	8,475	155,781	39,754	.....	6,307	33,447	21,644
Pennsylvania *Co.*	1,760[48]	3,546,516	700,445	4,627,655	660,807	903,256	78,993	1,801,535	93,287	3,537,878	1,089,777	—4,359	215,641	869,777	55,527
Pennsylvania *Railroad*	4,018[49]	11,055,992	2,591,628	14,527,248	1,560,082	3,024,404	185,383	5,506,578	377,229	10,653,676	3,873,572	—106,430	564,472	3,202,670	—5,326
Peoria & Eastern	352	217,634	51,807	288,122	32,551	39,694	4,740	121,233	5,371	203,589	84,533	.....	9,800	74,733	38,852
Pere Marquette	2,330[50]	921,995	270,813	1,299,316	148,013	273,358	29,782	709,926	34,922	1,196,001	103,315	—13,515	56,521	33,279	—118,200
Philadelphia, Baltimore & Washington	713	806,680	594,016	1,558,428	220,766	268,213	29,087	701,087	49,794	1,268,947	289,481	.....	49,268	240,213	—15,511
Pittsburgh & Lake Erie	215[51]	1,252,194	114,201	1,410,727	145,486	220,284	11,521	351,994	23,784	753,159	657,568	—289	31,000	626,279	38,364
Pittsburgh, Cincinnati, Chic. & St. Louis	1,467	2,696,567	621,709	3,656,826	371,575	694,898	69,432	1,375,930	68,020	2,579,855	1,076,971	—467	125,156	951,348	222,071
Rutland	468	165,665	74,850	270,071	29,150	58,454	7,331	118,856	6,947	220,738	49,333	.....	11,731	37,602	6,896
St. Louis, Brownsville & Mexico	510[52]	122,216	59,731	202,695	42,206	18,083	7,535	81,783	6,607	156,214	46,481	.....	5,150	41,331	3,888
St. Louis, Iron Mountain & Southern	3,315[53]	1,856,031	487,231	2,538,065	210,099	267,582	60,036	922,162	81,499	1,541,378	996,687	—3,342	118,315	875,030	—36,126
St. Louis Merchants' Bridge Terminal	9	.....	298	183,663	19,102	1,971	458	103,862	5,525	130,918	52,745	.....	5,600	47,145	25,308
St. Louis, San Francisco & Texas	244	82,674	21,636	111,306	18,447	14,734	4,371	54,709	6,096	93,357	12,949	.....	1,217	11,732	35,674
St. Louis Southwestern	843[54]	537,310	91,999	659,043	59,584	117,025	29,592	175,704	32,383	414,288	244,755	—502	22,562	221,691	—27,699
St. Louis Southwestern of Texas	703	228,722	62,493	313,688	74,667	93,020	11,833	165,677	17,779	362,976	—49,288	—588	10,945	—60,821	6,800
San Antonio & Aransas Pass	727	226,018	80,712	325,734	59,942	53,687	5,430	147,593	10,737	277,389	48,345	.....	11,000	37,345	63,808
Southern	7,090[55]	3,821,534	1,259,622	5,556,583	658,450	873,078	149,578	1,987,308	160,716	3,829,130	1,727,453	7,619	205,656	1,529,416	—5,822
Southern Kansas of Texas	125	96,601	17,359	120,728	11,314	25,155	1,839	47,678	4,305	90,291	30,437	.....	2,572	27,865	10,339
Southern Pacific Co.	6,222[56]	4,149,403	2,440,418	7,090,018	745,440	950,552	192,132	2,159,498	200,727	4,248,349	2,841,669	5,119	385,664	2,461,124	23,300
Syracuse, Binghamton & New York	81	59,447	28,152	98,646	13,319	9,620	2,983	39,305	2,151	67,378	31,268	.....	6,820	24,448	—6,549
Tennessee Central	294	90,024	28,074	125,206	25,692	18,087	5,313	46,158	6,993	102,243	22,963	.....	4,212	18,751	—22,001
Terminal R. R. Ass'n of St. Louis	35[57]	.....	264	264,080	33,110	24,859	706	105,933	4,896	169,504	94,576	10,374	26,000	78,950	42,278
Texas & New Orleans	458	230,650	80,027	333,152	46,212	75,937	9,545	145,308	11,412	288,414	44,738	—927	13,683	30,128	—23,793
Toledo & Ohio Central	441[58]	408,401	41,805	464,538	58,573	92,122	6,332	177,637	8,012	342,676	121,862	—485	20,385	100,992	55,656
Toledo, Peoria & Western	248	67,433	32,667	105,273	15,006	26,118	2,240	42,015	3,537	88,916	16,357	.....	5,000	11,358	5,178
Toledo, St. Louis & Western	451	274,685	23,760	318,197	24,398	48,170	8,601	120,505	7,794	209,468	108,729	.....	15,750	92,979	15,922
Union Pacific	3,537[59]	2,226,436	627,695	3,220,068	341,369	558,718	94,789	1,171,444	105,146	2,271,465	948,603	—5,517	159,950	783,136	—520,487
Union R. R. of Baltimore	9	108,038	18,781	128,506	6,932	.....	1,000	5,832	2,842	16,606	111,900	.....	5,414	106,486	5,838
Union R. R. of Pennsylvania	31	.....	.....	282,645	38,171	80,073	100	132,129	4,455	254,928	27,717	2,585	4,750	25,552	7,671
Vandalia	827	611,982	182,205	878,018	104,186	188,363	21,669	369,134	17,493	700,845	177,173	.....	28,687	148,486	—29,413
Vicksburg, Shreveport & Pacific	171	74,649	33,630	120,367	19,604	23,160	3,492	41,619	5,008	92,883	27,484	—50	6,300	21,134	—2,183
Virginia & Southwestern	240[60]	135,853	12,173	151,130	18,516	32,085	1,887	40,770	3,243	96,501	54,629	.....	5,331	49,298	25,349
Virginian	475[61]	382,591	16,945	409,911	59,356	77,779	4,955	118,972	7,982	269,044	140,867	5,288	17,600	128,555	32,744
Washington Southern	36	33,999	46,070	105,875	12,669	11,269	1,354	40,925	2,649	68,866	37,009	.....	3,245	33,764	3,908
West Jersey & Seashore	356[62]	173,417	231,194	428,377	72,312	80,517	11,910	218,899	13,771	397,409	30,968	—5,533	29,902	4,467	—28,020
Western Maryland	543	571,720	59,447	655,538	64,303	91,213	9,703	248,559	15,152	428,930	226,608	.....	21,000	205,608	—14,466
Western Ry. of Alabama	133	80,675	39,839	129,593	22,510	22,866	5,214	42,178	5,579	98,347	31,686	—7	4,612	27,067	6,667
Wheeling & Lake Erie	457	606,830	42,033	680,543	80,808	136,538	7,269	226,430	14,479	465,524	215,019	1,447	33,615	182,851	88,313
Yazoo & Mississippi Valley	1,372	609,985	170,087	850,985	128,851	123,411	16,573	377,800	26,579	673,214	177,771	1,111	37,000	141,882	—83,548

REVENUES AND EXPENSES OF RAILWAYS.

NINE MONTHS OF FISCAL YEAR, 1912.

Name of road.	Mileage operated at end of period.	Operating revenues: Freight.	Passenger.	Total, inc. misc.	Operating expenses: Maintenance: Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.	Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
Alabama & Vicksburg	143	$806,833	$375,481	$1,271,913	$187,145	$249,151	$33,752	$442,996	$46,218	$959,262	$312,651	—$5,626	$43,096	$263,929	—$109,446
Alabama Great Southern	309	2,401,443	885,707	3,584,092	402,805	783,026	100,553	1,115,069	86,386	2,487,839	1,096,253	—4,119	133,393	958,741	107,866
Atchison, Topeka & Santa Fe	8,201[1]	43,691,222	17,295,023	66,536,608	10,385,163	10,354,902	1,491,169	20,030,972	1,431,880	43,694,086	22,842,522	.....	2,690,793	20,151,729	—2,360,887
Atlanta & West Point	93	525,407	361,373	976,319	109,927	186,357	43,251	297,329	42,393	679,257	297,062	683	46,702	251,043	—11,790
Atlantic & St. Lawrence	167	809,092	236,645	1,149,199	260,347	194,341	40,095	586,170	31,882	1,112,835	36,364	.....	59,928	—23,564	26,268
Atlantic Coast Line	4,527[2]	16,615,768	6,427,901	24,837,926	3,239,929	3,631,343	412,056	8,565,878	649,010	16,498,216	8,339,710	.....	971,000	7,368,710	—348,995
Baltimore & Ohio—System	4,433[3]	53,387,625	11,089,122	68,437,417	8,162,245	12,584,040	1,450,862	24,479,618	1,493,085	48,169,840	20,267,567	—479,121	2,203,479	17,584,967	1,456,109
Bangor & Aroostook	627	1,974,201	482,334	2,591,978	407,499	291,996	36,398	802,457	102,234	1,640,584	951,394	.....	86,625	864,769	53,845
Boston & Maine	2,244[4]	19,962,659	11,912,720	34,403,739	4,567,767	4,838,240	344,481	16,161,391	773,256	26,685,135	7,718,604	145,240	1,569,811	6,294,033	338,114
Buffalo & Susquehanna *R. R.*	265	1,265,975	79,958	1,391,484	260,292	264,439	13,632	529,762	57,282	1,125,407	266,077	.....	23,400	242,677	22,884
Buffalo & Susquehanna *Ry.*	91	382,138	82,320	483,042	71,422	243,023	4,533	218,704	22,634	560,316	—77,274	374	12,600	—90,248	—26,529
Buffalo, Rochester & Pittsburgh	572	6,193,791	799,105	7,193,084	871,814	1,379,706	88,483	2,378,098	153,336	4,871,437	2,321,647	947	153,000	2,169,594	—208,367
Canadian Pacific Lines in Maine	233	684,040	247,074	995,742	189,407	155,590	48,736	486,158	38,484	918,375	77,367	.....	63,000	14,367	5,305
Carolina, Clinchfield & Ohio	238[5]	1,443,560	113,088	1,593,261	106,293	190,852	49,466	316,919	68,442	731,972	861,289	2,276	70,000	793,565	280,058
Carolina, Clinchfield & Ohio of S. C.	18	86,377	13,871	102,673	6,229	823	8,683	23,685	4,158	43,578	59,095	.....	4,500	54,595	18,623
Central of Georgia	1,915	7,026,775	2,879,592	10,892,061	1,344,916	1,915,706	305,399	3,667,195	342,371	7,575,587	3,316,474	51,293	455,056	2,912,711	—72,434
Central of New Jersey	672[6]	14,982,561	4,108,958	20,173,948	1,885,775	2,823,855	273,698	5,947,842	365,141	11,296,311	8,877,637	105,702	1,029,514	7,953,825	1,151,475
Central New England	277	2,242,395	254,020	2,623,365	366,126	200,229	11,467	709,236	24,774	1,311,832	1,311,533	—4,676	81,000	1,225,857	383,367
Charleston & Western Carolina	341	1,132,671	277,882	1,485,090	269,640	214,409	26,723	553,211	40,789	1,104,772	380,318	.....	45,000	335,318	—117,797
Chicago & Alton	1,025	7,420,210	3,129,380	11,390,670	1,481,153	2,237,804	360,339	4,202,616	296,777	8,578,689	2,811,981	—28,818	334,500	2,448,663	—204,603
Chicago & Eastern Illinois	1,275	8,917,126	2,220,201	12,004,538	1,257,560	2,329,089	269,828	4,468,801	368,036	8,693,314	3,311,224	—15,512	323,093	2,972,619	—387,822
Chicago & Northwestern	7,951[7]	34,883,651	14,942,845	55,356,170	6,901,913	7,499,872	1,030,291	23,522,836	1,115,777	40,070,689	15,285,481	—44,476	2,505,000	12,736,005	—1,758,923
Chicago, Burlington & Quincy	9,074[8]	44,490,323	16,050,129	66,642,035	7,323,306	11,416,949	1,156,146	21,940,104	1,696,758	43,533,263	22,928,772	—92,202	2,388,039	20,448,531	—785,815
Chicago, Indiana & Southern	359[9]	2,738,616	226,206	3,075,045	413,625	701,876	68,734	1,132,675	76,369	2,393,279	681,766	1,878	114,099	569,545	192,295
Chicago, Milwaukee & Puget Sound	2,059[10]	9,486,104	1,913,165	11,815,798	854,331	1,336,788	434,578	4,386,167	188,193	7,200,057	4,615,741	81,125	825,891	3,870,975	—572,615
Chicago, Milwaukee & St. Paul	7,511[11]	32,450,555	10,505,337	47,804,880	6,164,498	7,216,960	954,515	20,366,332	869,072	3,557,377	12,233,503	2,858	2,172,132	10,064,229	—1,200,512
Chicago, Peoria & St. Louis	255	974,246	260,293	1,301,598	168,997	256,574	65,436	589,149	53,861	1,134,017	167,581	.....	38,700	128,881	34,120
Chicago, Rock Island & Gulf	477[12]	1,584,747	470,989	2,207,499	253,555	215,143	89,719	773,271	73,739	1,405,427	802,072	—2,121	60,317	739,634	21,719
Chicago, Rock Island & Pacific	7,565[13]	29,910,849	13,723,480	46,655,057	6,502,527	6,298,776	1,419,184	19,299,383	1,286,198	34,806,068	11,848,989	—144,275	1,991,756	9,712,958	—2,152,073
Chicago, St. Paul, Minneapolis & Omaha	1,744	7,203,307	3,500,299	11,517,394	1,307,261	1,392,840	240,008	4,866,872	275,548	8,082,529	3,434,865	530	587,175	2,848,220	—1,132,251
Cincinnati, Hamilton & Dayton	1,015	5,476,068	1,242,123	7,518,410	776,006	1,277,736	174,619	3,180,126	169,721	5,578,208	1,940,202	.....	318,200	1,622,002	306,391
Cincinnati Northern	245[14]	803,444	166,034	1,016,785	183,940	213,795	24,516	431,701	27,971	881,923	134,862	.....	50,991	83,871	—57,736
Cleveland, Cincinnati, Chic. & St. Louis	2,012[15]	15,621,708	5,810,255	23,395,090	2,491,348	3,817,338	674,386	9,451,824	487,909	16,922,805	6,472,285	—25,776	867,512	5,578,997	1,377,464
Colorado Midland	338	1,096,299	202,598	1,431,886	174,563	266,358	63,863	622,078	48,526	1,175,388	256,498	—2,733	72,000	181,765	45,853
Colorado & Southern	1,075[16]	4,826,601	1,048,105	6,305,111	708,153	1,225,162	105,033	2,033,120	205,899	4,277,367	2,027,744	—10,426	240,300	1,777,018	—371,988
Cumberland Valley	162	1,613,629	499,494	2,218,123	381,884	288,093	40,675	733,086	69,626	1,513,364	704,759	3,607	53,326	655,040	—139,902
Delaware & Hudson Co.—R. R. Dept	854[17]	13,601,057	2,303,316	16,407,837	1,185,660	2,284,384	199,914	5,655,398	418,424	9,743,780	6,664,057	5,834	447,598	6,222,293	472,582
Delaware, Lackawanna & Western	958[18]	20,267,217	5,698,393	27,693,411	3,020,549	4,516,247	595,572	8,421,629	581,019	17,135,016	10,558,395	318,159	1,507,820	9,368,734	—391,757
Denver & Rio Grande	2,545	13,141,056	3,718,319	17,629,098	2,324,900	3,230,629	480,247	6,311,067	454,053	12,800,896	4,828,202	—17,434	676,000	4,134,768	—813,623
Denver, Northwestern & Pacific	215	654,124	234,706	930,681	129,324	147,960	20,879	336,526	30,769	665,458	265,223	.....	29,500	235,723	7,032
Detroit & Mackinac	358[19]	593,183	253,285	902,697	148,150	158,858	21,681	301,416	28,377	658,482	244,215	1,337	76,709	168,843	—50,077
Detroit, Grand Haven & Milwaukee	191	1,000,406	476,128	1,702,225	193,406	235,607	59,627	903,801	40,892	1,433,333	268,892	—456	25,919	242,517	26,954
Detroit, Toledo & Ironton	441	1,167,117	126,147	1,389,204	264,289	167,805	24,755	674,452	48,887	1,180,188	209,016	—34	53,583	155,399	122,160
Duluth & Iron Range	200[20]	4,480,626	194,562	4,759,101	651,095	464,316	7,655	966,028	101,721	2,196,815	2,568,286	4,923	228,656	2,344,553	—472,474
Duluth, Missabe & Northern	342[21]	4,673,743	330,594	5,076,485	784,428	556,098	16,593	983,168	120,308	2,460,595	2,615,890	33,581	244,219	2,405,252	—1,963,748
El Paso & Southwestern Co	902	4,576,116	721,355	5,580,701	715,541	772,892	109,876	1,566,309	206,855	3,371,473	2,209,228	—17,003	211,123	1,981,102	—12,623
Elgin, Joliet & Eastern	841[22]	7,143,234	36	7,543,883	681,681	1,353,046	37,703	2,268,806	143,425	4,484,661	3,059,222	.....	183,943	2,875,279	1,127,538
Erie	1,995	27,846,298	6,722,740	37,387,531	4,065,697	6,448,480	844,552	12,896,509	806,275	25,061,513	12,326,018	—156,778	1,390,623	10,778,607	—456,991
Florida East Coast	630[23]	1,414,240	1,320,185	3,128,956	495,118	425,220	67,960	1,159,593	89,135	2,237,026	891,930	—2,081	139,500	750,349	—212,285
Fort Worth & Denver City	454	2,477,077	1,120,666	3,786,980	353,499	602,569	62,630	1,269,682	125,781	2,414,161	1,372,819	—5,379	103,375	1,264,065	—184,879
Galveston, Harrisburg & San Antonio	1,338	5,495,826	2,222,087	8,152,117	992,735	1,455,615	300,380	3,175,867	250,100	6,174,697	1,977,420	—45,682	348,413	1,583,325	—562,535
Georgia	307	1,779,367	699,975	2,643,981	226,424	389,614	101,200	1,131,846	71,804	1,920,888	723,093	.....	24,049	699,044	55,055
Georgia Southern & Florida	395	978,829	642,615	1,875,404	188,324	358,278	65,350	721,315	83,626	1,416,893	458,511	.....	92,437	366,074	—1,797
Grand Rapids & Indiana	586[24]	2,265,812	1,328,003	3,888,032	414,837	642,699	101,419	1,666,563	132,510	2,958,028	930,004	—1,548	207,581	720,875	133,828
Grand Trunk Western	347	3,075,564	1,600,606	4,981,713	487,407	731,375	171,698	2,087,656	123,655	3,601,791	1,379,922	—10,648	284,715	1,084,559	159,935
Great Northern	7,345[25]	35,898,469	10,212,806	49,593,924	5,250,166	5,805,960	815,085	13,735,077	893,604	26,499,892	23,094,032	88,013	2,498,377	20,683,668	4,258,949
Gulf & Ship Island	307	1,068,573	312,284	1,499,738	197,495	268,687	21,629	438,412	75,370	1,001,593	498,145	.....	42,326	455,819	—46,388
Gulf, Colorado & Santa Fe	1,597[26]	6,748,259	2,219,857	9,561,354	1,567,520	1,433,940	240,635	3,679,365	296,194	7,217,654	2,343,700	.....	346,648	1,997,052	65,488
Illinois Central	4,755[27]	28,464,096	10,165,298	44,289,206	5,816,157	10,559,224	1,075,751	17,869,533	1,153,870	36,474,535	7,814,671	—73,716	2,036,538	5,704,417	—5,889,443
Indiana Harbor Belt	105[28]	.....	.....	1,966,397	226,034	218,904	26,205	891,813	67,558	1,430,514	535,883	23,359	38,437	520,805	290,259
Kansas City Southern	827	5,049,565	1,204,686	7,031,703	741,619	1,001,854	241,028	2,508,499	278,304	4,771,304	2,260,399	.....	298,914	1,961,485	—594,534
Lake Erie & Western	886	3,323,315	693,213	4,252,126	590,508	740,067	112,464	1,683,922	98,860	3,225,821	1,026,305	.....	176,296	850,009	160,831
Lake Shore & Michigan Southern	1,775[29]	24,855,686	8,747,126	38,038,901	3,958,632	5,174,438	760,824	12,568,379	685,728	23,148,001	14,890,900	—18,278	1,283,940	13,586,682	4,950,498
Lehigh & Hudson River	97	1,190,289	36,710	1,247,590	133,252	171,103	11,150	425,316	44,122	784,943	457,647	.....	31,500	426,147	56,701
Lehigh Valley	1,450[30]	24,534,070	3,531,668	29,031,802	3,223,812	5,070,055	727,028	9,854,008	615,545	19,490,448	9,541,354	—223,593	1,063,000	8,254,061	—273,369
Long Island	399[31]	2,470,588	5,096,715	7,903,606	1,056,799	976,955	116,950	3,670,561	191,197	6,012,372	1,801,234	482,636	490,671	1,883,199	347,738
Louisiana & Arkansas	255	880,242	158,318	1,081,199	182,024	166,125	21,301	297,861	41,381	708,692	372,507	.....	32,700	339,807	—52,977
Louisiana Western	207	898,577	489,441	1,465,033	174,665	259,174	69,731	492,276	59,030	1,054,876	410,157	2,008	64,341	347,824	—161,371

REVENUES AND EXPENSES OF RAILWAYS.

NINE MONTHS OF FISCAL YEAR, 1912—(CONTINUED).

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total, inc. misc.	Maintenance: Way and structures.	Maintenance: Of equipment.	Traffic.	Transportation.	General.	Total.					
Louisville & Nashville	4,722[32]	30,750,831	9,239,725	42,485,057	6,422,913	7,440,103	882,254	13,683,759	814,818	29,243,847	13,241,210	—25,828	1,343,883	11,871,499	665,461
Louisville, Henderson & St. Louis	200	607,192	307,172	974,608	208,344	123,573	38,827	328,428	26,885	726,057	248,551	2,730	27,000	224,281	33,473
Maine Central	1,204[38]	5,064,926	2,515,913	8,051,449	1,359,604	1,047,993	80,067	3,020,434	231,834	5,739,932	2,311,517	16,519	385,374	1,942,662	280,186
Michigan Central	1,817[34]	15,322,810	5,916,880	23,524,746	2,593,502	2,790,487	583,735	9,197,981	402,480	15,568,185	7,956,561	26,191	1,030,371	6,952,381	2,694,601
Midland Valley	373[35]	716,300	338,316	1,124,314	236,616	175,556	27,009	353,757	57,511	850,449	273,865	558	52,068	222,355	—30,957
Missouri, Kansas & Texas	1,744[36]	8,539,645	3,287,157	12,590,095	1,542,183	1,833,823	319,811	4,167,202	373,470	8,236,489	4,353,606	—19,845	500,926	3,832,835	—174,352
Missouri Pacific	3,915[37]	13,221,371	3,506,205	18,402,238	3,186,698	3,354,969	533,477	8,614,794	642,606	16,331,544	2,070,694	—32,082	784,194	1,254,418	—202,271
Mobile & Ohio	1,114	7,031,185	1,097,485	8,649,953	991,089	1,603,791	306,784	3,086,110	286,606	6,274,380	2,375,573	—8,564	229,400	2,137,609	—90,554
Monongahela	65	938,917	20,932	973,310	126,490	81,462	3,031	203,987	17,379	432,349	540,961	.....	23,430	517,531	75,230
Morgan's La. & Tex. R. R. & S. S. Co.	404	2,666,065	949,368	3,844,301	487,238	502,002	123,141	1,548,395	111,274	2,772,050	1,072,251	—17,352	167,300	887,599	—269,926
Nashville, Chattanooga & St. Louis	1,230[38]	6,232,800	2,222,254	9,088,155	1,342,926	1,677,320	346,509	3,360,876	231,981	6,959,612	2,128,543	—8,373	222,300	1,897,870	—216,439
Nevada Northern	165	953,929	98,509	1,079,042	115,309	134,268	3,502	231,761	31,079	515,919	563,123	.....	45,336	517,787	29,472
New Orleans & North Eastern	196	2,148,095	479,625	2,825,219	264,916	530,019	82,109	1,064,728	105,414	2,047,186	778,033	—7,798	78,421	691,814	—109,103
New Orleans Great Northern	282	874,545	258,238	1,221,488	187,629	161,697	23,374	393,565	66,142	832,407	389,081	—644	16,173	372,264	—75,957
New York Central & Hudson River	3,597[39]	46,721,074	23,907,899	78,961,501	10,122,019	12,938,453	1,676,480	29,929,810	2,008,879	56,675,641	22,285,860	279,355	4,524,432	18,040,783	3,072,283
New York, Chicago & St. Louis	562	7,186,879	1,172,170	8,690,718	958,820	919,749	417,538	3,669,494	152,071	6,117,672	2,573,046	—15,873	297,125	2,260,048	288,104
New York, New Haven & Hartford	2,092[40]	23,787,345	20,048,705	48,171,976	4,818,472	5,737,203	287,093	18,844,338	1,445,548	31,132,654	17,309,322	1,051,730	2,870,000	15,221,052	1,173,277
New York, Ontario & Western	566[41]	5,369,544	1,280,648	6,909,362	962,924	1,164,599	88,133	2,692,088	154,291	5,062,035	1,847,327	—10,198	161,250	1,675,879	—165,591
New York, Philadelphia & Norfolk	112	1,935,436	338,375	2,454,077	251,507	437,151	36,293	982,335	110,704	1,817,990	636,087	.....	68,700	567,387	—47,496
Norfolk & Western	2,014[42]	24,931,129	3,263,451	29,244,104	3,425,720	5,729,590	473,693	8,731,328	564,667	18,924,998	10,319,106	—18,450	1,050,000	9,250,656	517,553
Norfolk Southern	608	1,550,850	628,516	2,365,478	273,211	289,972	49,726	780,741	118,356	1,512,006	853,472	—3,674	67,500	782,298	3,655
Northern Central	473[43]	7,334,057	1,727,014	9,632,062	1,032,827	2,062,575	133,098	4,824,366	222,313	8,275,179	1,356,883	4,649	350,545	1,010,987	101,122
Northern Pacific	6,032[44]	32,936,181	11,515,723	47,580,314	5,462,191	5,305,761	870,406	15,725,465	743,948	28,107,771	19,472,543	269,878	2,479,161	17,263,260	—315,311
Oregon Short Line	1,762[45]	11,165,700	3,452,734	15,577,541	1,705,875	1,537,610	254,145	3,870,681	320,293	7,688,604	7,888,937	—5,620	1,005,690	6,877,627	177,423
Oregon-Washington R. R. & Nav. Co.	1,920[46]	7,701,008	3,725,892	12,296,706	1,595,314	1,301,877	396,919	4,386,007	398,520	8,078,637	4,218,069	10,885	928,319	3,300,635	—593,354
Pecos & Northern Texas	479[47]	1,132,054	292,631	1,497,585	202,621	304,247	23,397	524,149	49,597	1,104,011	393,574	.....	41,355	352,219	44,930
Pennsylvania *Co.*	1,760[48]	29,902,545	6,566,735	39,921,438	5,353,584	7,267,844	676,367	14,229,160	789,951	28,316,906	11,604,532	—18,531	1,736,682	9,849,319	—320,234
Pennsylvania *Railroad*	4,018[49]	89,008,103	25,559,081	122,641,108	13,819,385	24,514,838	1,655,314	45,681,832	3,109,931	88,781,300	33,859,808	—1,164,080	5,329,004	27,366,724	—423,472
Peoria & Eastern	352	1,724,727	537,334	2,435,587	311,948	348,382	46,741	1,010,961	51,499	1,769,531	666,056	.....	87,602	578,454	—39,578
Pere Marquette	2,330[50]	8,464,121	3,095,923	12,598,475	1,552,144	2,088,751	319,147	5,908,694	300,101	10,168,837	2,429,638	—52,670	510,442	1,866,526	—12,603
Philadelphia, Baltimore & Washington	713	6,919,807	5,864,025	14,254,579	1,972,699	2,455,699	248,084	6,029,873	351,743	11,058,098	3,196,481	.....	451,990	2,744,491	—14,329
Pittsburgh & Lake Erie	215[51]	10,750,723	1,151,983	12,272,764	1,309,665	1,939,493	115,403	2,934,306	213,390	6,512,257	5,760,507	—2,536	270,389	5,487,582	—7,374
Pittsburgh, Cincinnati, Chic. & St. Louis	1,467	21,207,306	6,007,541	30,547,804	3,979,935	5,685,516	610,947	11,086,598	595,888	21,958,884	8,588,920	—7,818	1,134,847	7,446,255	—423,472
Rutland	468	1,387,745	893,978	2,576,337	304,483	409,837	65,125	1,036,938	59,337	1,875,720	700,617	.....	101,148	599,469	703,856
St. Louis, Brownsville & Mexico	510[52]	1,052,712	537,522	1,726,382	369,357	124,086	30,640	614,055	66,743	1,204,881	521,501	.....	49,085	472,416	33,326
St. Louis, Iron Mountain & Southern	3,315[53]	16,827,546	4,656,194	23,047,204	3,638,879	3,204,579	483,800	7,543,166	646,953	15,517,377	7,529,827	—48,268	801,315	6,680,244	215,866
St. Louis Merchants' Bridge Terminal	9	.....	2,828	1,351,370	212,814	82,116	3,974	737,594	46,153	1,082,651	268,719	.....	52,132	216,587	575,118
St. Louis, San Francisco & Texas	244	689,276	246,039	997,788	165,559	139,399	27,900	452,817	43,883	829,558	168,230	.....	9,539	158,691	—77,690
St. Louis Southwestern	843[54]	4,543,510	1,015,264	5,857,891	526,254	958,182	256,462	1,454,857	220,721	3,416,476	2,441,415	—8,510	190,913	2,241,992	154,256
St. Louis Southwestern of Texas	703	2,411,817	781,792	3,422,149	499,312	738,103	110,333	1,363,938	157,798	2,869,484	552,665	—2,316	95,552	454,797	—118,435
San Antonio & Aransas Pass	727	2,424,058	903,291	3,526,528	580,355	424,893	50,919	1,290,845	89,763	2,436,775	1,089,753	.....	99,000	990,753	412,362
Southern	7,090[55]	31,263,377	12,835,479	47,923,233	5,735,625	7,601,711	1,251,144	16,569,040	1,415,013	32,572,533	15,350,700	49,858	1,833,603	13,566,955	188,943
Southern Kansas of Texas	125	800,035	142,623	988,491	148,534	213,224	18,661	378,703	36,757	795,879	192,612	.....	23,472	169,140	180,897
Southern Pacific Co.	6,222[56]	40,147,225	23,488,549	68,326,426	7,731,368	8,421,616	1,582,443	19,821,479	1,761,797	39,288,703	29,037,723	202,321	3,031,274	26,208,770	—85,637
Syracuse, Binghamton & New York	81	461,519	304,094	870,094	102,461	63,304	25,022	324,735	20,824	536,346	333,748	.....	57,780	275,968	—845,131
Tennessee Central	294	772,993	293,856	1,134,447	206,253	160,282	48,029	428,705	73,638	916,907	217,540	.....	37,879	179,661	—19,283
Terminal R. R. Ass'n of St. Louis	35[57]	.....	2,215	2,095,827	309,993	216,758	6,313	779,550	49,617	1,362,231	733,596	80,259	247,011	566,844	—166,481
Texas & New Orleans	458	1,941,288	773,212	2,892,141	478,668	655,073	74,097	1,172,751	94,324	2,474,913	417,228	—3,243	131,760	282,225	—77,977
Toledo & Ohio Central	441[58]	3,497,826	487,358	4,073,247	612,081	597,011	59,791	1,410,578	74,727	2,754,188	1,319,059	—7,625	184,886	1,126,548	—220,579
Toledo, Peoria & Western	248	590,033	339,866	984,848	149,593	216,836	20,890	374,549	30,682	792,550	192,298	.....	43,600	148,698	—10,820
Toledo, St. Louis & Western	451	2,446,521	328,747	2,961,793	332,548	543,804	74,460	1,094,768	76,943	2,122,523	839,270	.....	132,500	706,520	—7,644
Union Pacific	3,537[59]	24,768,853	7,731,759	35,870,367	3,226,247	4,539,643	942,139	10,514,545	958,211	20,180,785	15,689,582	—22,949	1,515,867	14,150,766	—58,032
Union R. R. of Baltimore	9	931,130	183,399	1,129,179	88,866	.....	7,225	50,611	22,519	169,221	959,958	.....	51,780	908,178	—3,324,058
Union R. R. of Pennsylvania	31	.....	.....	3,067,970	278,109	724,379	914	1,156,508	33,069	2,192,979	874,991	31,846	58,073	848,764	—44,523
Vandalia	827	5,089,779	1,828,555	7,764,586	1,028,574	1,499,924	228,435	3,078,209	168,678	6,003,820	1,760,766	.....	254,029	1,506,737	309,073
Vicksburg, Shreveport & Pacific	171	647,759	368,460	1,115,143	196,792	196,173	28,766	350,705	42,029	814,465	300,678	—1,510	61,671	237,497	—143,616
Virginia & Southwestern	240[60]	1,151,952	123,756	1,307,304	155,850	264,802	16,460	381,504	33,975	852,591	454,713	.....	44,254	410,459	—69,928
Virginian	475[61]	3,274,911	196,604	3,570,087	433,637	644,519	45,397	991,718	71,114	2,186,385	1,383,702	46,886	141,400	1,289,188	123,929
Washington Southern	36	289,587	347,883	847,872	102,811	92,027	11,100	331,453	24,614	562,005	285,867	.....	29,204	256,663	324,686
West Jersey & Seashore	356[62]	1,435,361	3,015,917	4,756,385	738,880	831,085	118,391	2,084,806	100,732	3,873,894	882,491	—34,246	230,546	617,699	—20,126
Western Maryland	543	4,469,932	701,151	5,395,725	614,963	675,853	91,297	1,974,892	123,995	3,481,000	1,914,725	—393	189,000	1,725,332	—234,294
Western Ry. of Alabama	133	623,818	375,108	1,084,024	173,226	199,208	48,319	304,871	54,380	780,004	304,020	127	41,511	262,636	—165,182
Wheeling & Lake Erie	457	5,003,847	462,936	5,816,442	667,579	1,047,635	66,539	1,902,651	126,319	3,810,723	2,005,719	20,549	271,177	1,755,091	30,308
Yazoo & Mississippi Valley	1,372	5,174,453	1,968,434	7,712,169	1,399,692	1,128,821	145,492	3,065,744	238,225	5,977,974	1,734,195	—1,075	339,887	1,393,233	442,262 —1,132,114

Operated at the end of the previous period—[1] 7,550; [2] 4,495; [3] 4,434; [4] 2,243; [5] 236; [6] 631; [7] 7,744; [8] 9,091; [9] 341; [10] 2,005; [11] 7,512; [12] 471; [13] 7,549; [14] 246; [15] 1,979; [16] 1,173; [17] 819; [18] 930; [19] 360; [20] 191; [21] 317; [22] 832; [23] 583; [24] 587; [25] 7,328; [26] 1,518; [27] 4,576; [28] 113; [29] 1,663; [30] 1,433; [31] 395; [32] 4,591; [33] 1,180; [34] 1,805; [35] 324; [36] 1,737; [37] 3,921; [38] 1,255; [39] 3,591; [40] 2,040; [41] 546; [42] 1,990; [43] 469; [44] 6029; [45] 1,646; [46] 1,737; [47] 296; [48] 1,416; [49] 3,977; [50] 2,331; [51] 191; [52] 501; [53] 3,313; [54] 797; [55] 7,039; [56] 6,187; [57] 34; [58] 444; [59] 3,473; [60] 242; [61] 474; [62] 353. — Indicates Deficits, Losses and Decreases.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

The officers of the Rome, Watertown & Ogdensburg, the Utica & Black River, and the Oswego & Rome, having resigned, their places have been taken by the officers of the New York Central & Hudson River.

W. J. Cunningham, auditor of disbursements of the Chicago Great Western with office at Chicago, has been appointed auditor of freight receipts, succeeding H. Ernest resigned, M. E. Keehan succeeds Mr. Cunningham.

Lewis A. Riley, president of Lehigh & Hudson River, with headquarters at Philadelphia, Pa., has been elected president pro tem of the Lehigh & New England, to fill the vacancy caused by the death of W. A. Lathrop.

G. C. Jones, general manager of the Central Vermont, with office at St. Albans, Vt., has been appointed vice-president in charge of construction and operation of the Southern New England Railroad Corporation and the Southern New England Railway, subsidiaries of the Grand Trunk, with office at Providence, R. I.

The office of superintendent of motive power of the Atchison, Topeka & Santa Fe System having been merged in that of vice-president in charge of operation, John Purcell, superintendent of shops at Topeka, Kan., has been appointed assistant to the vice-president, with office at Chicago, and will handle mechanical department matters.

Stacy B. Lloyd, assistant general solicitor of the Pennsylvania Railroad, with office at Philadelphia, Pa., has been appointed assistant general counsel. Alan H. Strong, solicitor at New Brunswick, N. J., has been appointed general attorney, with office at Philadelphia, and J. H. Baer, chief clerk to the freight claim agent, has been appointed assistant freight claim agent.

R. N. Begien, whose appointment as assistant to third vice-president of the Baltimore & Ohio, with office at Baltimore, Md., has been announced in these columns, was born in New England, and was educated at the Engineering School of Harvard University, having been a member of the class of 1897. Mr. Begien went to Central America, and for three and a half years was a member of the Nicaragua Canal Commission. Resigning from that position he went to South America, and for a year was a railway engineer in Ecuador. He then returned to the United States to enter the engineering department of the District of Columbia. In August, 1902, he was appointed assistant engineer of the Baltimore & Ohio, with office at Somerset, Pa., and in June, 1908, he was made engineer of the Philadelphia division. Mr. Begien was appointed assistant engineer of the same company, with office at Baltimore, on May 1, 1910, under A. W. Thompson, and when Mr. Thompson became general manager he remained as his assistant, and on May 1, he was made assistant to third vice-president.

R. N. Begien.

C. B. Rodgers, formerly general manager of the St. Louis, Brownsville & Mexico at Kingsville, Tex., has been elected first vice-president of the Louisiana Railway & Navigation Company, with office at Shreveport, La., succeeding C. Ellerbe, assistant to the president and treasurer, resigned. H. B. Helm, secretary and general superintendent, has been elected second vice-president and treasurer; and J. J. Tippin, auditor, has been elected auditor and secretary, both with office at Shreveport.

C. R. Gray, president of the Spokane, Portland & Seattle and the Oregon Trunk, with headquarters at Portland, Ore., is to be made president of the Great Northern, succeeding L. W. Hill, as noted on page 1058. J. H. Young, vice-president of the Copper River & Northwestern, and president of the Alaska Steamship Company, with office at Seattle, Wash., succeeds Mr. Gray, with office at Portland. Robert W. Baxter, general superintendent of the Illinois Central lines north of the Ohio river, succeeds Mr. Young, with office at Seattle.

The Pennsylvania Railroad has discontinued the practice of designating the vice-presidents as first vice-president, second vice-president, etc., and has changed the titles to the following: Samuel Rea, vice-president; W. W. Atterbury, vice-president in charge of operation; George D. Dixon, vice-president in charge of traffic; Henry Tatnall, vice-president in charge of finance; W. Heyward Myers, vice-president in charge of real estate, purchases and insurance. These officers hold the same positions, in effect, as heretofore, with the exception of Mr. Dixon, who has been freight traffic manager and now succeeds to the duties of J. B. Thayer, who was lost on the Titanic. George Dallas Dixon was born in Philadelphia Pa., on March 28, 1857, and began railway work in the general freight department of the Pennsylvania Railroad, in the claim department, from which he was transferred to the rate department, holding different positions there until he finally became chief rate clerk. In December, 1894, he was appointed division freight agent at Baltimore, and in May, 1899, was made assistant general freight agent of the Pennsylvania Railroad, the Philadelphia, Wilmington & Baltimore, the Northern Central, and the West Jersey & Seashore companies, and on June 1, 1903, by a change in the organizations of the above companies, he was appointed freight traffic manager, which position he held at the time of his recent election as vice-president in charge of traffic.

G. D. Dixon.

Operating Officers.

Charles H. Holmes has been appointed assistant general manager of the Wheeling & Lake Erie, with headquarters at Cleveland, Ohio.

A. F. Church, superintendent of the New Orleans, Mobile & Chicago, with office at Laurel, Miss., has been appointed general superintendent with office at Laurel.

Horace McEwen, train despatcher of the Prince Edward Island Railway, with office at Charlottetown, P. E. I., has been appointed superintendent, succeeding G. A. Sharp, retired.

C. L. Brevoort, superintendent of terminals of the Cincinnati, Hamilton & Dayton at Cincinnati, Ohio, has had his jurisdiction extended over the Baltimore & Ohio Southwestern.

J. W. Callahan, assistant superintendent of the Indiana-Harbor Belt, with office at Gibson, Ind., has been appointed general manager of the Illinois Tunnel Company with office at Chicago.

D. Sallee, trainmaster of the Missouri, Oklahoma & Gulf at Allen, Okla., and until recently superintendent of the Texas line of the company at Denison, Tex., has been appointed superintendent, with office at Muskogee, Okla.

J. P. Kavanagh, assistant superintendent of the Indiana division of the Baltimore & Ohio Southwestern, at Cincinnati, Ohio,

has been appointed superintendent of the Baltimore terminals of the Baltimore & Ohio, with office at Baltimore, Md.

E. J. Wright, superintendent of the Hudson division of the New York Central & Hudson River, with office at New York, has been appointed general superintendent in charge of the Eastern district, with office at Albany, succeeding W. J. Fripp, promoted, and C. Christie succeeds Mr. Wright, with office at New York.

Henry B. Voorhees, whose appointment as general superintendent of the Baltimore & Ohio Southwestern and the Cincinnati, Hamilton & Dayton, with office at Cincinnati, Ohio, has been announced in these columns, was born January 22, 1876, at Saratoga Springs, N. Y., and in 1896 graduated as a civil engineer from Rensselaer Polytechnic Institute at Troy, N. Y. He began railway work with the Philadelphia & Reading in March, 1897, as assistant supervisor of the Shamokin division, and was subsequently promoted to supervisor, to assistant trainmaster and then to trainmaster. From December, 1901, until the time of his present appointment on May 1, 1912, he was with the Baltimore & Ohio, having been consecutively assistant engineer at Pittsburgh, division engineer and then assistant to the general superintendent of transportation at Baltimore, superintendent and general agent of the Philadelphia division at Philadelphia; from May, 1910, to July, 1911, assistant to the president, and from the latter date until May 1, 1912, general superintendent of transportation, with office at Baltimore.

H. B. Voorhees.

Edwin C. Blanchard, who has been appointed general manager of the Northern Pacific lines west of Paradise, Mont., with office at Tacoma, Wash., as has been announced in these columns, was born July 29, 1854, at Wapello, Iowa, and received his education in the common and high schools. In December, 1874, he began railway work with the Burlington, Cedar Rapids & Northern, now part of the Rock Island system, as a telegraph operator; and he went with the Kansas Pacific, now part of the Atchison, Topeka & Santa Fe, in 1876, remaining with that road, first as telegraph operator, and later as train despatcher, until 1883. He then went with the Northern Pacific, where he has been consecutively train despatcher, chief despatcher; division superintendent at Minneapolis for six years from 1897, and division superintendent at Duluth from 1903 to 1909. In the latter year he was appointed general superintendent, with office at St. Paul, Minn., from which position he was recently promoted to general manager of the lines west of Paradise.

E. C. Blanchard.

J. T. Olhausen, superintendent of the Baltimore & Ohio, with office at Baltimore, Md., has been transferred to Philadelphia, Pa., succeeding J. B. Carothers, resigned. O. H. Hobbs, superintendent at Cumberland, Md., succeeds Mr. Olhausen, and J. W. Kelly, Jr., assistant superintendent of the Cumberland division, with headquarters at Keyser, W. Va., has been promoted to superintendent at Cumberland. J. D. Brooke succeeds Mr. Kelly, with office at Keyser.

J. W. Meehan, superintendent of the Vicksburg division of the Yazoo & Mississippi Valley at Greenville, Miss., has been transferred to the New Orleans division, with office at Vicksburgh, Miss., succeeding J. W. Dodge, resigned. Patrick Laden succeeds Mr. Meehan. N. W. Spangler has been appointed assistant superintendent of the Memphis division, with office at Memphis, Tenn. J. R. Rison, Jr., trainmaster of the Memphis division at Tutwiler, Miss., has been appointed trainmaster of the New Orleans division, with office at Wilson, La., succeeding V. V. Boatner, transferred to the Vicksburg division, with headquarters at Greenville, Miss.

C. C. Riley, whose appointment as general superintendent of transportation of the Baltimore & Ohio and the Baltimore & Ohio Southwestern, with office at Baltimore, Md., has been announced in these columns, was born on October 1, 1864, at Cumberland, Ind. He attended Butler College and the Indiana College of Physicians and Surgeons, and he began railway work in the operating department of the Cleveland, Cincinnati, Chicago & St. Louis in 1888, remaining with that company until 1897, when he became superintendent of car service and afterwards superintendent of transportation of the Baltimore & Ohio Southwestern, at Cincinnati, Ohio. From 1901 to 1903 he was car service agent of the Chicago Great Western, and was then car service agent of the Erie. He was promoted to superintendent of transportation of the same company, and in 1908 was appointed superintendent of transportation of the Kansas City Southern, from which position he was promoted to general superintendent of that road. Mr. Riley was appointed assistant to general manager of the Baltimore & Ohio in December, 1911, which position he held at the time of his recent appointment as general superintendent of transportation, as above noted.

C. C. Riley.

Albert E. Clift, general superintendent of the Illinois Central lines south of the Ohio river, with office at New Orleans, has been appointed general superintendent of the lines north of the Ohio river with office at Chicago, succeeding Robert W. Baxter resigned to accept service with another company. John F. Porterfield, superintendent of the St. Louis division, with office at Carbondale, Ill., has been appointed general superintendent, with office at New Orleans, succeeding Mr. Clift. John J. Gaven, superintendent of the Tennessee division, with office at Fulton, Ky., succeeds Mr. Porterfield and John J. Pelley, roadmaster of the Tennessee division, with office at Fulton, succeeds Mr. Gaven. William C. Costigan, supervisor at Carbondale, Ill., has been appointed roadmaster, with office at Fulton, succeeding Mr. Pelley.

Traffic Officers.

P. A. Jordan has been appointed soliciting freight agent of the Houston & Texas Central at Dallas, Tex.

L. F. Boss has been appointed contracting freight agent of the Wabash Railroad, with office at Omaha, Neb.

T. J. Faulconer has been appointed soliciting agent of the Kanawha Despatch, with office at Indianapolis, Ind.

J. L. Moore has been appointed traveling immigration and industrial agent of the Northern Pacific, with office at Helena, Mont.

John McGraw has been appointed general agent of the Southern Pacific lines in Louisiana, with office at New Orleans, succeeding J. W. Hyams, deceased.

J. W. Jordan has been appointed traveling freight agent of the Chicago, Indianapolis & Louisville, with office at Indianapolis, Ind., succeeding J. Q. David, resigned.

A. H. Murphy has been appointed traveling passenger agent of the Chicago, Milwaukee & St. Paul, with office at Philadelphia, Pa., succeeding M. S. Bowman, transferred to Atlanta, Ga.

Willis Calloway, commercial agent of the Atlanta, Birmingham & Atlantic, at Jacksonville, Fla., has been appointed commercial agent of the Winston-Salem Southbound, with office at Jacksonville.

E. E. Hook, general agent of the Atchison, Topeka & Santa Fe at Leavenworth, Kan., has been appointed division freight agent, with office at Wichita, Kan., succeeding O. A. Brown, resigned to engage in other business.

G. F. Herr, general passenger agent of the Western Pacific, with office at San Francisco, Cal., resigned on May 1 to devote his time to private business at Los Angeles. No successor to Mr. Herr will be appointed for the present.

J. B. Nessle, general coal and ore agent of the New York Central lines west of Buffalo, N. Y., with office at Cleveland, Ohio, has had his office transferred to Pittsburgh, Pa., and M. D. Flanigan has been appointed general agent of the coal and ore department, with office at Cleveland.

G. O. Somers, for two years general freight agent of the Chicago Great Western, with office at Chicago, has resigned, to become manager of the Canada Bond Corporation, Toronto, Ont. Mr. Somers was formerly for three years general traffic manager of the United Fruit Company, and before that assistant to first vice-president of the Chicago, Burlington & Quincy.

Edwin P. Bates, general freight agent of the Pennsylvania Railroad, with office at Philadelphia, Pa., who has been appointed assistant freight traffic manager, was born in Allegheny county, Pa., on September 19, 1861, and was educated at Beaver College. He began railway work on March 7, 1882, as a clerk in the office of the assistant general freight agent of the Pennsylvania Company. After four years of work as a clerk, he was made chief clerk of the general freight agent of the Allegheny Valley Railroad, and in November, 1887, he was appointed special agent. From February, 1891, until July 31, 1900, he was general freight agent of the Allegheny Valley, and from August 1, 1900, to May 31, 1903, was division freight agent of the Buffalo & Allegheny Valley division, with headquarters at Pittsburgh, Pa. Mr. Bates was appointed general freight agent of the Pennsylvania Railroad on June 1, 1903, which position he held at the time of his recent promotion to assistant freight traffic manager.

E. P. Bates.

J. H. Pierson, soliciting freight agent of the Atlanta, Birmingham & Atlantic, at Birmingham, Ala., has been appointed commercial agent, with office at Birmingham, succeeding O. L. Newton, resigned to go into other business. O. Sanders succeeds Mr. Pierson, with office at Birmingham, and W. L. Wallace has been appointed assistant foreign freight agent, with office at Memphis, Tenn., succeeding J. D. Hardin, Jr., resigned.

Charles W. Tomlinson, commercial freight agent of the Baltimore & Ohio at Chicago, has been appointed general eastern freight agent, with office at New York City, succeeding E. M. Davis, who has been made division freight agent, with headquarters at Youngstown, Ohio. H. S. Garvey, commercial freight agent at Milwaukee, Wis., succeeds Mr. Tomlinson at Chicago; and D. E. Sullivan, export soliciting agent at Chicago, succeeds Mr. Garvey.

Robert Clinton Wright, general freight agent of the Pennsylvania Railroad, with office at Philadelphia, Pa., who has been appointed freight traffic manager, was born in Rio de Janeiro, Brazil, on December 5, 1869, and was educated in the public schools of Baltimore, Md., and at Baltimore City College. Mr. Wright began railway work in March, 1888, as a messenger and clerk at the Patterson's wharf station, of the Northern Central, at Baltimore. From December, 1889, to June 1, 1897, he served as clerk in the general agent's office at Baltimore and from June 1, 1897, to December 31, 1898, he was soliciting agent of the Star Union Line. From January to May, 1899, he was special agent of transportation of the Pennsylvania Railroad, and from May, 1899, to January, 1901, was division freight agent of the same road, at Altoona, Pa. In January, 1901, Mr. Wright became division freight agent at Harrisburg, Pa. On June 1, 1903, he was appointed assistant general freight agent at Philadelphia, and since March 1, 1906, was general freight agent in charge of local freight, and now becomes freight traffic manager.

R. C. Wright.

George Dickie Ogden, assistant general freight agent of the Pennsylvania Railroad, with office at Philadelphia, Pa., has been promoted to general freight agent. Mr. Ogden was born at Homer City, Indiana county, Pa., May 16, 1868. He received his education at the Indiana Normal School and at Washington and Jefferson College, and entered the service of the Pennsylvania Railroad as freight and ticket agent, at Homer, Pa., in June 1887. He was transferred to Allegheny City yard as night yard clerk, in October, 1890, and was made transportation clerk in the superintendent's office, of the West Penn division, in November, of the same year. He was transferred to Butler, West Penn division, as freight and ticket agent, in May, 1891, to McKeesport as freight agent and yardmaster, in February, 1895, and to Harrisburg as freight agent, in January, 1898. Mr. Ogden was promoted to division freight agent, at Altoona, Pa., on January 14, 1901. He was transferred to the B. & A. V. division, Pittsburgh, in the same capacity on June 1, 1903, and since March 1, 1906, he was assistant general freight agent at Philadelphia, and now becomes general freight agent.

G. D. Ogden.

E. M. Jones, traveling freight agent of the Southern Railway at St. Louis, Mo., has been appointed commercial agent, with office at Peoria, Ill. C. S. Bourque, traveling freight agent at

Cairo, Ill., has been appointed commercial agent, with office at Cairo. J. R. L. Wulff, traveling freight agent at Kansas City, Mo., has been appointed commercial agent, with office at Omaha, Neb., in charge of Nebraska and the western half of the state of Iowa, and D. B. Hevron has been appointed freight soliciting agent, with office at Evansville, Ind.

R. C. Wright, general freight agent of the Pennsylvania Railroad, with office at Philadelphia, Pa., has been appointed freight traffic manager. E. P. Bates, general freight agent, with office at Philadelphia, has been appointed assistant freight traffic manager. George D. Ogden, assistant general freight agent, with office at Philadelphia, has been appointed general freight agent, and Walter Thayer, assistant general freight agent, with office at Philadelphia, has been appointed general freight agent. Charles E. Kingston, division freight agent, with office at Wilmington, Del., has been appointed assistant general freight agent. J. L. Eysmans, division freight agent, with office at Pittsburgh, has been appointed assistant general freight agent. John M. Gross, division freight agent, with office at Baltimore, Md., succeeds Mr. Eysmans. J. B. Large, freight solicitor, with office at Reading, has been appointed division freight agent, with office at Erie. F. P. Truesdale, special agent at Uniontown, has been appointed division freight agent, with office at Uniontown.

Walter Thayer, assistant general freight agent of the Pennsylvania Railroad, with office at Philadelphia, Pa., who has been promoted to general freight agent, was born April 27, 1874. He received his early education at the Haverford, Pa., schools, and was graduated from the University of Pennsylvania in the class of 1897. Mr. Thayer entered the service of the Pennsylvania Railroad in the fall of 1895, as a receiving clerk in the Thirtieth and Market streets freight station, Philadelphia. In 1896 he was transferred to Dock street station as a clerk in the claim department, and in 1897 he was again transferred to the rate room at the Broad street station. He was then promoted to freight solicitor of the United Railroads of New Jersey. In the fall of 1901 he was made special agent in the freight department of the Buffalo & Allegheny Valley division, with headquarters at Pittsburgh. In 1903 he was appointed eastern manager and general freight agent of the Erie & Western Transportation Company—Anchor Line—with headquarters at Philadelphia. On June 1, 1910, he was appointed assistant general freight agent of the Pennsylvania Railroad, and now becomes general freight agent of the same company.

W. Thayer.

Engineering and Rolling Stock Officers.

W. I. Rowland, master mechanic of the Baltimore & Ohio at Grafton, W. Va., has been appointed assistant road foreman of engines of the Baltimore division, in charge of the engines of the Baltimore and Washington terminals, with headquarters at Baltimore, Md.

E. A. Gilbert, formerly western representative of W. H. Miner at Chicago, has been appointed general inspector of the motive power department of the Southern Pacific at San Francisco, Cal. He will have charge of all matters pertaining to rolling stock and shop practice.

Thomas McPherson, trackmaster of the Intercolonial at Newcastle, N. B., has been appointed general roadmaster of the Intercolonial and the Prince Edward Island, with headquarters at Moncton. A. P. Giles, trackmaster at Pictou, N. S., succeeds Mr. McPherson, and J. C. Fulmore succeeds Mr. Giles.

John Hair, formerly superintendent of motive power of the Baltimore & Ohio Southwestern, at Cincinnati, Ohio, has been appointed safety inspector, and a member of the General Safety Committee, representing the mechanical department of the Baltimore & Ohio, with headquarters at Baltimore, Md., succeeding W. L. Robinson, promoted.

E. A. Probst has been appointed division engineer in charge of construction of the line of the Southern New England Railroad Corporation, from Palmer, Mass., to Blackstone, with office at Southbridge, Mass., and T. I. Ellis has been appointed division engineer of the Southern New England Railway, in charge of construction of the line from Providence, R. I., to Woonsocket, with office at Providence. These are subsidiary companies of the Grand Trunk.

A. P. Prendergast, superintendent of motive power of the Baltimore & Ohio Southwestern at Cincinnati, Ohio, has had his jurisdiction extended over the Cincinnati, Hamilton & Dayton; and H. H. Hale, who has been superintendent of motive power and car department of the Cincinnati, Hamilton & Dayton at Cincinnati, has been appointed superintendent of the car department of both roads.

John C. Holden, who has been appointed division engineer of the Canadian Pacific, with office at Winnipeg, Man., was born February 18, 1876, at St. John, N. B. He was educated at the Royal Military College at Kingston, Ont., and in 1892 began work with the Intercolonial Railway, remaining with that road for four years. Since 1898 he has been with the Canadian Pacific. He was on preliminary location, construction and reconnoissance work until 1903, and was then for four years resident engineer on maintenance work. From 1907 until April 1, 1912, the time of his recent promotion, he was assistant engineer on maintenance on the Manitoba division.

F. F. Busteed, who has been appointed engineer in charge of grade revision and double tracking from Calgary west of the Canadian Pacific, with office at Kamloops, B. C., as has been announced in these columns, was born October 10, 1858, at Battery Point, Bonaventure, Que. He was educated at a Montreal high school and McGill University, and in March, 1881, began railway work with the Canadian Pacific. He was with the engineering department of that road until 1903, having been consecutively transitman, assistant engineer on construction, rodman, assistant engineer, resident engineer, engineer maintenance of way and structures, and division engineer. He was made superintendent in 1903, and for three years from 1904 he was assistant chief engineer of the Western lines. From 1907 until the time of his present appointment he was general superintendent, first of the British Columbia and then of the Manitoba division.

OBITUARY.

Hon. James P. Mabee, chief railway commissioner of Canada, died at Toronto on Monday of this week from heart failure, following an operation for appendicitis. Mr. Mabee was born at Port Rowan, Ont., in 1859, and was admitted a barrister in 1882, practicing at Listowel and Stratford. In 1901 he was appointed a King's Counsel, and continued practice in Toronto. He was appointed a justice of the High Court of Ontario in 1905, and in 1908 succeeded A. C. Killam, K. C., as chairman of the railway commission.

Work has been started on a 35-mile connecting line of the Midland railway, Uruguay, from Tresarboles to Piedra Sola, in the department of Tacuarembo. This line, although comparatively short, will be of great importance, particularly to the cities of Fray Bentos and Paysandu, as it will afford each an almost straight through line to the border city of Rivera, the northernmost point of the department of Rivera. Paysandu, with more than 20,000 inhabitants, is one of the greatest live stock centers in Uruguay, and Fray Bentos, the capital of the department of Rio Negro, has about 8,000 inhabitants. When the new connecting line has been completed a large section of Uruguay will be reached more easily and cheaply from Fray Bentos and Paysandu than from any other distributing points in the country.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Carolina & Northwestern has ordered 2 consolidation locomotives from the Baldwin Locomotive Works.

The St. Louis Southwestern has ordered 18 consolidation locomotive and 4 mogul locomotives from the Baldwin Locomotive Works.

The Missouri, Oklahoma & Gulf has ordered 5 Mallet locomotives and 4 consolidation locomotive from the Baldwin Locomotive Works.

The Hayden Machinery & Supply Company, New York, has ordered 2 four-wheel switching locomotives from the Baldwin Locomotive Works.

The Detroit & Mackinac has ordered 3 ten-wheel locomotives from the American Locomotive Company. The dimensions of the cylinders will be 21 in. x 28 in.; the diameter of the driving wheels will be 63 in., and the total weight in working order will be 185,000 lbs.

The Bingham & Garfield has ordered 1 Mallet locomotive (0-8-8-0) from the American Locomotive Company. The dimensions of the cylinders will be 26 in. and 41 in. x 28 in.; the diameter of the driving wheels will be 51 in., and the total weight in working order will be 461,000 lbs.

CAR BUILDING.

The Temiskaming & Northern is in the market for 4 steel underframe caboose cars.

The Buffalo Creek & Gauley has ordered 300 hopper cars from the Pressed Steel Car Company.

The American Refrigerator Transit Company has ordered 500 refrigerator cars from the American Car & Foundry Company.

The Barrett Manufacturing Company, New York, has ordered 100 tank cars from the American Car & Foundry Company.

The Chicago, Milwaukee & St. Paul has ordered 15 standard sleeping cars, 10 tourist sleeping cars, 2 cafe-observation cars, and one barber shop-smoking-observation car from the Barney & Smith Car Company; also 20 coaches and 10 baggage cars, 72 ft. 6 in. long, from the American Car & Foundry Company.

The Louisville & Nashville is building 400 gondola cars, 100 flat cars, 100 stock cars, 500 box cars and 100 refrigerator cars at the company's shops. This company has ordered 500 steel underframes from the Pressed Steel Car Company, 500 steel underframes from the Mt. Vernon Car & Manufacturing Company and 200 steel underframes from the Bettendorf Axle Company.

SIGNALING.

New Installations of Block Signals, Interlocking, Telephones for Train Despatching, Etc.

The General Electric Company has received from the Pennsylvania Railroad an order for eighty-two 6-kw. transformers, thirty-seven 1-kw. transformers, and seven sectionalizing outfits, to be used at Wilmington, Del., and Lafayette, Pa.

The Indiana state railway commission has ordered the Cleveland, Cincinnati, Chicago & St. Louis to instal automatic block signals between Delmar and Coal Bluff, 26.4 miles, and has ordered the Baltimore & Ohio Southwestern to equip with automatic signals short sections of the road at and near the principal yards, namely, Vincennes, Washington, Seymour, North Vernon, Cochran and Mitchell; and at the tunnels at Willow Valley and Tunnelton. The commission has approved the manual block system as now in use on parts of the Wabash, and also on parts of the Cleveland, Cincinnati, Chicago & St. Louis. On certain minor lines the commission has decided not to require the use of the block system.

Supply Trade News.

The Union Draft Gear Company, Chicago, has moved its main offices to 1162 McCormick building.

The Automatic Ventilator Company, New York, has moved its main offices from 120 Liberty street to 2 Rector street.

The Adams & Westlake Company, Chicago, has moved its Philadelphia office to 2218 Ontario street.

The Remy Electric Company, Anderson, Ind., recently received an order from the Rock Island Lines for 40 electric headlights.

The Ashton Valve Company, Boston, Mass., has moved its Chicago office from 166 West Lake street to 174 North Market street.

The Chicago-Cleveland Car Roofing Company has moved its New York office to room 368, 50 Church street. Arthur S. Lewis has been added to the staff as eastern representative.

The Roberts & Schaefer Company, Chicago, will on May 11 move its general offices from the Old Colony building to the McCormick building, Van Buren street and Michigan boulevard.

H. McL. Harding, New York, consulting engineer for the design of terminal installation and freight handling machinery, has moved his offices from 20 Broad street to the Whitehall building, 17 Battery place, New York.

The general offices of the Gulick-Henderson Company, Pittsburgh, Pa., inspecting engineers, have been moved to 525-529 Third avenue, Pittsburgh. This company recently opened an office at 444 Market street, San Francisco, Cal.

The reorganization committee of the Allis-Chalmers Company, Milwaukee, Wis., has received a majority of the assents and deposits and will carry out its plan mentioned in the *Railway Age Gazette* of March 22. The time to deposit bonds and stocks with the Central Trust Company, New York, has been extended to and including June 1.

Clayton D. Walworth, formerly with the U. S. Wind Engine & Pump Company, Batavia, Ill., and Fairbanks, Morse & Company, Chicago, has been made manager of the Chicago office of the Q. & C. Company, New York. Henry A. Hawes, formerly in the sales department of the Railway Steel-Spring Company New York, has gone to the Q. & C. Company, with office in New York.

The Zug Iron & Steel Company, Pittsburgh, Pa., has opened an office at Detroit, Mich., to handle its business in that district, including Cincinnati, Ohio, Cleveland, Toledo and Buffalo, N. Y. This office will be in charge of Edward A. Hawks as district sales manager. Mr. Hawks will retain his position as representative of the Beaver Dam Malleable Iron Company, Beaver Dam, Wis., in the territory from Chicago east to the coast.

James Rawle, president of the J. G. Brill Car Company, Philadelphia, Pa., died at his home at Bryn Mawr May 1 at the age of 70. Mr. Rawle graduated from the University of Pennsylvania in 1861 as a civil engineer. In 1872 he became a partner with John G. Brill and George M. Brill in the manufacture of street railway cars. In 1887, when the firm was incorporated as the J. G. Brill Company, Mr. Rawle took charge of the finances.

The court of appeals of the District of Columbia on April 22 rendered a decision in the suit of Peter H. Murphy against the Baltimore & Ohio for infringement of the Murphy outside metal car roof patents in roofs furnished by the Chicago-Cleveland Car Roofing Company, reversing the decision of the Supreme Court of the District of Columbia rendered on November 27, 1911, which held that the patents had been infringed. (See *Railway Age Gazette*, December 15, 1911, page 1256).

The National Fireproofing Company, Chicago, is conducting a series of tests on tile, brick and concrete slabs and walls, under the supervision of R. W. Hunt & Company, testing engineers. Readings will be taken to determine the bending moments in the different constructions up to the failing point and careful compilations of all data secured will be preserved. An invitation has

been extended to all architects, engineers and builders to witness the tests at the company's testing station at Twenty-sixth street and Shields avenue, Chicago. Two tests are being held each day on May 6, 7, 8, 14, 15 and 16.

The Railway Storage Battery Car Company, 30 Broad street, New York, has been organized by F. J. Lisman & Company, New York, and associates, to sell Edison-Beach cars made by the Federal Storage Battery Car Company, Silver Lake, N. J. The company will have $4,000,000 capital, of which $3,000,000 will be common stock and $1,000,000 preferred stock. T. D. Rhodes, vice-president of the New York, Westchester & Boston, and receiver of the Detroit, Toledo & Ironton, will be president of the new company, William Goodman, of F. J. Lisman & Company, will be vice-president, and Ernest Rosenbaum will be secretary.

TRADE PUBLICATIONS.

White Pass & Yukon Route.—The traffic department of this company has published an illustrated folder on Alaska and the Yukon, in which the many attractions of the region are described.

Heater Cars.—The Alcohol Heating & Lighting Company, Chicago, has issued an illustrated booklet, describing its combined alcohol heater and refrigerator cars for the handling of perishable freight.

Unions.—The National Tube Company, Pittsburgh, Pa., has devoted bulletin No. 9 to the results of tests of Kewanee unions. The bulletin also describes the construction of these unions and points out their advantages.

Chicago, Burlington & Quincy.—The passenger department of this company has published an attractive folder on the Yellowstone National Park, giving information which will be found very useful to those thinking of visiting the park.

Chicago & North Western.—The passenger department has issued an attractive folder entitled Short Jumps for Busy People, describing summer resorts in Illinois and Wisconsin; also a booklet on the lakes and resorts of the Northwest.

Pumps.—The Ingersoll-Rand Company, New York, has published form No. 7004 on Cameron steam pumps. This bulletin is illustrated and describes in detail the construction and operation of these pumps. Prices and dimension tables are also included.

Southern Pacific.—The passenger department of this company, in accordance with its co-operative community plan, has published an unusually attractive booklet on Grant's Pass and Josephine County, Oregon. This booklet is exceptionally well illustrated and includes valuable information on the climate, the soil, the facilities, the agricultural products and the mining resources of the Rogue River valley. The booklet also gives a brief account of the irrigation development and discusses the prices of land and of the cost of living.

Quelimane is the outlet for the richest and most productive section of Portuguese East Africa. The Zambezia Company, holding a large land grant from the Portuguese government, owns an 18-mile railway starting from the port of Quelimane. Besides this private enterprise the provincial government has called for tenders for 15 miles of the Nhamacurra railway, which is to connect Nhamacurra with Villa Durão, 50 miles. This railway will tap a most fertile region.

The Australian government proposes to employ 1,500 men on the construction of the Trans-Australian line, and will give preference to union men. The experience of the officials with non-unionists has led them to believe that they are not only idlers, but spend a large part of their time trying to convert union men to their methods and thought. For this reason the government will not change its policy of giving preference to unionists on the government works, especially in railway construction. Tenders have already been called for the supply of 135,000 tons of 80-lb. rails and 2,000,000 ties for the Trans-Australian railway. The rails will be imported, but Australian wood ties will be used instead of concrete, which was originally intended.

Railway Construction.

New Incorporations, Surveys, Etc.

Alberta Central.—Announcement is made that this company intends to complete the line from Red Deer, Alta., to Rocky Mountain House during 1912. A meeting is to be held at Montreal, Que., on June 4, to consider whether the line should be leased to the Canadian Pacific, and to decide upon means of raising funds for building branches and for the equipment of the lines. D. F. McArthur is the contractor, and J. G. McGregor, chief engineer.

Anderson & Saline River.—This company, which operates a line from Clio, Ark., to Millerville, will build a branch, it is said, from Stoudemeyer north to a point at or near Junet. J. S. Bell, chief engineer, Pine Bluff.

Arkansas Roads.—According to press reports, plans are being made to build a north and south line through Harrison, Ark., on which work is to be started soon. L. S. Powers, Hawesville, Ky., is said to be back of the project.

Arkansas Valley Interurban.—Rights of way are being secured, it is said, for an extension north from Newton, Kan., to Goessel, 44 miles. Charles D. Bell, chief engineer and superintendent, Wichita.

Atchison, Topeka & Santa Fe.—According to press reports, this company proposes to pierce a tunnel and improve its line at Cajon Pass, Cal. The grade is to be reduced from 3 per cent. to 2.24 per cent. It is estimated that the work will cost $1,000,000. Some double-tracking work is also to be carried out. C. F. W. Felt, chief engineer, Topeka, Kan.

Atlantic & Western.—Work is to be started at once on an extension. The line is now in operation from Sanford, N. C., to Broadway, 10 miles. The company's charter permits it to build from Goldsboro, N. C., west to the Tennessee river, 300 miles. F. G. Hatton, vice-president, Roanoke, Va.

Aurora, Mendota & Western.—Incorporated in Illinois, with office at Plano, Ill., to build from Yorkville, in Kendall county, Ill., west to Mendota, Lasalle county, about 40 miles. The incorporators include G. H. Simpson, Wheaton; C. S. Williams, Yorkville, and C. A. Darnell, Plano.

Bartlett Western.—This company, which operates a line from Bartlett, Tex., west to Jarrell, 12 miles, and which recently completed an extension west to Florence, will built an extension from Bartlett east to Cameron, about 30 miles, this work is to be financed by the Bankers Trust Company, Houston. An extension is also projected from Florence to a point west. C. J. Grainger, first vice-president and general manager, Bartlett. (November 3, p. 930.)

Boston & Albany.—An officer writes that the company plans to carry out improvements, which depend, however, upon the possible sale of bonds. The work will include laying third-track between Parks Corner, Mass., South Framingham and Ashland. There will be a considerable amount of remodeling at the local freight yard at Worcester, including extensions to a number of sidings to accommodate 50-car trains, this work is to be carried out by the company's forces. The company has not planned to build any new passenger stations this year, but has under consideration the question of extending and enlarging one or two freight stations, including the station at Pittsfield, where a second-story will probably be constructed to accommodate the clerical force, and the space now occupied by the offices on the first floor will be used for freight. The plans call for building a general storehouse at West Springfield, but it has not yet been decided whether this will be built or not. There are a large number of railway and highway bridges to be rebuilt and repaired. This work is a continuance of the company's bridge reconstruction program, under which 64 bridges were replaced within the past 18 months. The greater part of the work will be carried out by the company's forces. F. B. Freeman, chief engineer, Boston.

Campbellford, Lake Ontario & Western.—The location plans of this company have been approved by the Railway Commissioners of Canada, from mile 15 to mile 58½, and construction

work is now under way. W. H. McGann, engineer, with headquarters at Belleville, Ont.

Canadian Northern.—Interests identified with this company are quoted as saying that plans are being made to build an electric line to connect Toronto, Ont., and Guelph, also a line from Toronto to Bowmanville. These two lines are to form part of a system of steam and electric lines to be built by various companies in western Ontario, and connecting with the Canadian Northern lines east and west.

Canadian Northern Pacific.—This company has been granted permission to build a parallel line through the Canadian Pacific right of way on the south side of the South Thompson river between Black canyon and Oregon Jack creek, B. C., four miles. The company will not build a line on the north bank of the river. T. H. White, chief engineer, Vancouver.

Chicago, Milwaukee & St. Paul.—Morris, Shepard, Dougherty, St. Paul, Minn., who have the general contract for 74 miles of second-track work on the Hastings & Dakota division, will sublet about three-fifths of the work. C. F. Loweth, chief engineer, Chicago. (April 26, p. 982.)

Crosbyton-South Plains.—It is understood that this company is planning to build an extension to connect with the Stamford & Northwestern at Spur, Tex., about 28 miles. A line is also projected through Guthrie, Okla., and Benjamin, Tex., to Seymour, where a connection is to be made with the Gulf, Texas & Western, and the Wichita Valley lines. A branch to Matador is also contemplated. J. M. Bassett, vice-president and general manager, Crosbyton, Tex.

Dunlap Northern & Pacific.—Incorporated in Oklahoma, to build from Dunlap, Harper county, Okla., north to a connection with the Union Pacific at Ellis, Kan. The incorporators include H. D. Knight, G. A. Elbow, W. P. Rodman and C. Nowalin, all of Oklahoma City.

Edmonton, Dunvegan & British Columbia.—This company will push construction work at once, and hopes to have the line in operation to the crossing of the Athabasca river, B. C., 100 miles, this year, and to Dunvegan within three years. J. D. McArthur, president, Winnipeg, Man.

Great Northern.—An officer writes regarding the reports that surveys are being made for an extension through McKenzie, Dunn, Oliver and Mercer counties, N. D., that the plans are not far enough advanced to give particulars. A. H. Hogeland, chief engineer, St. Paul.

The line from Princeton, B. C., to Coalmont, 11 miles, has been opened for business.

Ha Ha Bay.—The Canadian parliament has voted a subsidy at the rate of from $3,200 to $6,400 a mile to this company for building new lines as follows: From St. Mathias bay, Que., to Ha Ha bay, about 20 miles; LaBrosse Junction to the Saguenay river, five miles; Laterrierre Junction north to Lake Kenogami, 12 miles; and from Bagotville to St. Alexis, three miles. The Quebec legislature has voted a subsidy of 4,000 acres of land a mile for the completion of the line to Ha Ha bay, for 9½ miles, and 2,000 acres a mile for branches to Chicoutimi, four miles, and to Lake Kenogami through La Terrierre, two miles. J. F. Grenon, chief engineer, Chicoutimi.

Jacksonville, McRae & Dublin.—An officer writes that it has not yet been decided when bids will be asked for building from Jacksonville, Ga., north via McRae to Dublin, 65 miles. The work will include putting up three trestles. The line is expected to find a traffic in cotton, fertilizer, merchandise, naval stores and lumber. M. L. McRae, president, McRae. (March 29, p. 780.)

Kansas City & Memphis.—This company, it is said, is now at work on an extension from Clear Creek, Ark., east. M. Hays, chief engineer, Rogers.

Lake Erie & Youngstown (Electric).—This company has asked the Ohio Public Service Commission for permission to issue $10,500,000 of stock and bonds, to be used for paying for the right of way, 80 per cent. of which has been secured for constructing 70 miles of double-track, and to buy land as follows: Fifty-seven acres of lake front on Lake Erie; 200 acres at Burghill; 256 acres north of the Vienna, Ohio, coal deposits, and 67 acres near Youngstown for terminal facilities. If the commission grants the permission, the company expects to have the road ready for operation by May, 1914. J. H. Ruhlman, president, Youngstown.

Lake Superior & South Dakota.—This company has been incorporated in Minnesota with $100,000 capital, to build from Duluth, Minn., west to the western boundary of Big Stone county, about 225 miles. It is said that this is a project of the Chicago, Milwaukee & St. Paul. J. M. Smith, president; W. R. Gillis, vice-president, Superior, Wis.; W. Getly, treasurer, and Frank Crassweller, secretary, Duluth, Minn.

Live Oak, Perry & Gulf.—An officer is quoted as saying that this line is to be reconstructed from Live Oak, Fla., to Perry. The roadbed is to be regraded and heavy grades eliminated, and the curvature reduced. 60-lb. rail is to be laid to replace the present 40-lb. sections. R. P. Hopkins, secretary and general manager, Dowling Park.

Louisville & Nashville.—According to press reports, this company will spend $12,000,000 for improvements in Tennessee and Alabama, of this amount $5,528,000 is to be spent in Alabama. The work will be carried out if the company decides to sell at this time securities to obtain funds. The improvements include double-tracking work, new bridges, yards, etc. The yards at Montgomery, Ala., are to be enlarged to about three times their present size. W. H. Courtenay, chief engineer, Louisville, Ky. (April 26, p. 982.)

Manitoba & Nelson.—Incorporated in Manitoba, to build from Kildonan, near Winnipeg, Man., north to Sturgeon bay, thence to Grand Rapids and north and easterly to Hudson bay, also to build branch lines. The provincial directors include C. W. N. Kennedy, C. Volkes, Winnipeg; A. C. Clare, Parkdale, and B. S. Benson, Selkirk.

Midland Continental.—An officer writes that the plans call for a line from Edgeley, N. D., north via Franklin, Nortonville and Millerton, to Jamestown, thence northeast to Pembina, about 230 miles: Grading has been finished to Jamestown, and other grading contracts are to be let. Track has been laid on 10 miles. There will be a number of trestles on the line. The company expects to develop a traffic in grain, lumber, etc. F. K. Bull, president, Racine, Wis.; H. Pravitz, general superintendent, and H. H. Hurning, chief engineer, Edgeley, N. D.

Minneapolis, St. Paul & Sault Ste. Marie.—An officer writes that work is now under way by Foley, Welch & Stewart, St. Paul, Minn., building an extension from Fordville, N. D., west via Devils Lake, N. D., to Drake, 130 miles. H. Pederson, assistant engineer, Minneapolis, Minn.

National Railways of Mexico.—An officer writes that a contract has been given to Gonzalez Trevino Hermanos, Monterey, Mexico, to build from Allende, Mexico, kilometer 51 on the Monlcova division, north. The maximum grades will be 0.07 per cent., and maximum curvature 3 deg. There will be two steel bridges of 300 ft. each, and a number of trestles and tunnels. This line will be through an agricultural section, which has been irrigated. A contract has also been given to the Sombrerete Construction Company, F. W. Johnston, president, Mexico City, for building 71 miles between Canitas and kilometer 154½ of the Durango-Canitas line, and a six-mile branch from kilometer 154½ to Sombrerete. The maximum grades eastbound will be 1 per cent., westbound 1.2 per cent., and maximum curvature 6 deg. There will be four steel bridges varying in length from 50 ft. to 160 ft., also some trestles and tunnels. This line is being built through a mining section, and this territory has good agricultural and cattle farms. G. P. DeWolf, chief engineer of construction, Mexico City.

New Iberia & Northern.—This road has been extended from New Iberia, La., south to Charenton, 21 miles. R. J. Lockwood, chief engineer, New Iberia.

Ocilla Southern.—This road has been extended from Alapha, Ga., south to Nashville, 13 miles. J. A. J. Henderson, president and general manager, Ocilla.

Pacific Great Eastern.—Engineers are now at work locating a line out of North Vancouver, B. C., and from Ft. George south. Construction work will be started at an early date and will be pushed to completion. The company is negotiating with

the Burrard Inlet Tunnel & Bridge Company for the use of the bridge to be built over the second narrow of Burrard Inlet, and with the Vancouver, Westminster & Yukon for trackage rights. The Howe Sound & Vancouver, already built from Vancouver north towards Pemberton Meadows, may be taken over by the company. J. W. Stewart, president; P. Welch, vice-president and general manager, and J. Callaghan, chief engineer, Fitzhugh, Alta. The company has an office at Vancouver.

PINE BLUFF, SHERIDAN & SOUTHERN.—An officer writes that contracts are to be let at once to build from Sheridan, Ark., south via Millersville and Mornings Ferry to Mannville. J. F. McIntyre, president, Pine Bluff.

RALEIGH, CHARLOTTE & SOUTHERN.—An officer writes that contracts are let to build from Varina, N. C., west to Colon, about 25 miles. Lane Brothers & Company, Altavista, Va., are the principal contractors. F. L. Nicholson, chief engineer, Norfolk, Va.

ST. LOUIS & SAN FRANCISCO.—According to press reports, double-tracking work is to be carried out on various sections between Memphis, Tenn., and St. Louis, Mo., and between Birmingham, Ala., and Kansas City, Mo. F. G. Jonah, chief engineer construction, St. Louis.

TEXAS ROADS.—A company has been incorporated in Texas with $200,000 capital, and headquarters at San Antonio, to build a terminal belt line, about 15 miles long, to connect with the yards and stations of the railways entering San Antonio. The incorporators include F. Trumbull and C. E. Schaff, of the Missouri, Kansas & Texas; A. S. Coke, St. Louis; and E. Chamberlin, L. J. Hart, G. C. Vaughan and W. Walthall, both of San Antonio.

UINTAH.—This company, which operates a narrow gage line from Mack, Colo., northwest to Watson, Utah, 63 miles, it is said will make improvements, including grade reduction work, piercing five tunnels, the longest of which is to be about 3,000 ft., and changing the existing line to broad gage. M. W. Cooley, general manager, Mack.

WINNIPEG, SALINA & GULF.—Negotiations are now under way for the sale of $13,000,000 of bonds in Paris, and it is expected that as soon as these are completed construction work will be started. The company was organized to build a north and south line from Winnipeg, Man., to the Gulf of Mexico, with a cross line from Kansas City, Mo., to Des Moines, N. Mex. Surveys have been finished on 200 miles. The Brindley Company, New York, has the general contract. H. Leon Miller, president; O. T. Johnson, vice-president; C. C. Whitehead, secretary; and H. E. Wylie, special engineer, Salina, Kan.

RAILWAY STRUCTURES.

BEDFORD, N. Y.—The New York Public Service Commisison, Second district, has ordered the elimination of the grade crossing on the Harlem division of the New York Central & Hudson River at Babbitt's crossing in Bedford, Westchester county. The highway is to be carried under the existing tracks at a point 15 ft. north of the present crossing by means of a subway.

DETROIT, MICH.—The Michigan Central has let the general contract to the George A. Fuller Company for the construction of its new passenger terminal. An order for 10,000 tons of steel, to be used in the station structure and train sheds has been given to Jones & Laughlin.

FREDERICTON, N. B.—The Fredericton & Grand Lake Coal & Railway Co. has given orders to the Dominion Bridge Co., Montreal, Que., for steel work for bridges to be erected, as follows: Over Little river, two 80-ft. half deck girder spans; over Burpee mill stream, one 80-ft. half deck girder span; over Noonan creek, one 40-ft. half deck girder span, and over the Nashwaak river, four 80-ft. half deck girder spans. D. F. Maxwell, Fredericton, N. B., is chief engineer.

HARTVILLE, WYO.—The Colorado & Southern is planning the construction of a roundhouse and shops.

INDIANAPOLIS, IND.—The Pennsylvania Lines are reported to have authorized an expenditure of approximately $200,000 for the construction of a roundhouse and the alteration of yard facilities.

LAUREL, MISS.—The New Orleans, Mobile & Chicago has let a contract for the construction of a new freight and passenger station to W. M. Carter of Laurel.

LOUISVILLE, KY.—The Kentucky & Indiana Terminal is spending about $2,025,000 on a new heavy double-track bridge over the Ohio river, between Louisville, Ky., and New Albany, Ind., with highways on each side for team traffic. On the Kentucky side work is in progress on a new concrete coal elevator of 500 tons capacity and a hump classification yard of 1,200 cars capacity.

MANHEIM, ILL.—The Chicago, Milwaukee & St. Paul has begun the construction of an outbound yard between Manheim and Bensonville, about 15 miles from Chicago, which will be a duplicate of the inbound yard built at this point last year. The work will be done by company forces and will also include the building of a 30-stall engine house, 90-ft. turntable and a mechanical coaling station.

NORFOLK, VA.—An officer of the Norfolk & Western writes that a contract has been given to Henry Steers, Inc., New York, for dredging about 400,000 cu. yds. of material for the new coal pier to be built at Lambert's Point. The company has three other piers at that place. The material dredged is to be used in making land that will be used for extending the yards, approaches to piers, etc. The same contractor has the contract for building a bulkhead, a protecting break-water, and for the substructure of the steel coal pier, which is to be 1,200 ft. long, beyond the bulkhead line, 90 ft. above high water and 60 ft. wide. The Virginia Bridge & Iron Company, Roanoke, Va., has the contract for erecting the substructure of the pier. (May 3, p. 1028.)

PERRY, IOWA.—The Chicago, Milwaukee & St. Paul is planning to build a new passenger station at this point, and is seeking a site for a new roundhouse and machine shop.

PORT ARTHUR, ONT.—The Canadian Northern has completed plans for the construction of a new steel dock at Port Arthur, to cost $30,000. The construction contract has been given to Barnett & McQueen Company; this firm will also construct new grain elevators for the railway company at Port Arthur. The betterments to be done on the company's line between Port Arthur and Winnipeg include the completion of revision work at Rainy Lake, laying out a new freight terminal at St. Boniface, near Winnipeg, with a capacity of 700 cars and 100 miles of track, and the construction of a new bridge for freight traffic into Winnipeg.

PRINCE RUPERT, B. C.—Preliminary contracts have been let by the Grand Trunk Pacific for the construction of a large dry dock and ship building plant, including piers, landing stage, building platform and launching ways, to the British-American Construction Company.

PITTSFIELD, MASS.—See Boston & Albany under Railway Construction.

PORTLAND, ORE.—Extensive terminal improvements, to cost about $3,000,000, are contemplated by the Hill lines on the property recently secured on the east side of Portland.

SPOKANE, WASH.—The Great Northern has let contracts to Guthrie & McDougall for work amounting to about $35,000, including additions to station facilities and trackage and the removal of five steel bridges.

TACOMA, WASH.—The Chicago, Milwaukee & Puget Sound will begin work this summer on a new passenger terminal at an estimated expenditure of $1,000,000.

TORONTO, ONT.—Plans for the grade separation of the Canadian Pacific and the Canadian Northern tracks in North Toronto have been agreed upon and approved by the Board of Railway Commissioners. The plans call for improvements from Summerhill avenue to Dufferin street. Work on the subways at Yonge street and at Avenue road must be started by July and finished by December of this year.

WEST SPRINGFIELD, MASS.—See Boston & Albany under Railway Construction.

Railway Financial News.

Atlanta, Birmingham & Atlantic.—The holders of about 98 per cent. of the $6,216,800 joint notes of the Atlantic & Birmingham Construction Company and the Atlanta, Birmingham & Atlantic, due May 1, 1912, have agreed to extend these notes until May 1, 1915. (See *Railway Age Gazette,* April 12.)

Atlantic & Western.—Middendorf, Williams & Company, Baltimore, Md., have bought all the outstanding stock and bonds, $52,400 and $100,000 respectively, of this company. It is said that the road will be operated by the purchasers. The road extends from Sanford, N. C., to Broadway, 10 miles, connecting with the Seaboard Air Line, the Southern Railway and the Atlantic Coast Line.

Boston & Maine.—See an item in general news.

Boston & Providence.—The railway committee of the Massachusetts Senate has unanimously reported a bill authorizing this company, a subsidiary of the New York, New Haven & Hartford, to issue not over $8,000,000 bonds, due in not exceeding 75 years, guaranteed principal and interest by the New York, New Haven & Hartford, to provide for electrification, additional tracks, elimination of grade crossings, etc.

Canada Southern.—The stockholders of the Michigan Central, of which this company is a subsidiary, on May 2 authorized the guarantee by the M. C. of principal and interest of the 50-year bonds, interest not to exceed 5 per cent. of the Canada Southern, of which $40,000,000 will be authorized and $22,000,000 issued for refunding, etc.

Central Vermont.—Blair & Co., New York, have purchased $1,000,000 5 per cent. notes of the Central Vermont Transportation Company, issued to pay for two new steamships and guaranteed by the Central Vermont, the United States subsidiary of the Grand Trunk. These notes are dated May 1, 1912, and are due $50,000 semi-annually beginning with November, 1912.

Denver, Northwestern & Pacific.—Judge Harry C. Riddle, in the United States district court, Denver, Col., on May 2 appointed Vice-President and General Manager D. C. Dodge and Secretary-Treasurer S. M. Perry as receivers of the property on the application of the Denver Railway Securities Company, the holding company of the railway. Also, upon request of the executors of the estate of David H. Moffat, the court appointed W. W. Watson receiver for the Denver Railway Securities Company. The Denver Railway Securities defaulted May 1 on the principal and interest due on $3,500,000 6 per cent. collateral trust notes dated May 1, 1911. A half interest in the Securities company is owned by the estate of D. H. Moffat, who endorsed $4,000,000 5 per cent. notes of the Colorado-Utah Construction Company. These notes are now deposited as security for the Securities company 6 per cent. notes. A protective committee has been formed of Benjamin Strong, Jr., vice-president, Bankers Trust Company, New York; Herman Waldeck, vice-president, Continental & Commercial National Bank, of Chicago; E. F. Shanbacker, president, Fourth Street National Bank, Philadelphia, Pa.; H. H. Wehrhane, of Hallgarten & Co., New York, and George H. Burr. White & Page are counsel for this committee. (See also comments on another page.)

Denver & Rio Grande.—Stockholders have authorized the $25,000,000 7 per cent. cumulative adjustment 20-year bonds, and have ratified a mortgage of the company's property to secure the issue. The present issue will be only $10,000,000. (See *Railway Age Gazette* of March 15 and April 5.)

Galveston, Houston & Henderson.—See an item in regard to the valuation of this property in State Commission news.

Grand Trunk Pacific.—Jules Hone has been made government representative on the board of directors, succeeding Alfred Brunett.

Interborough Rapid Transit.—J. P. Morgan & Co., New York, will pay off $15,000,000 one-year notes of this company due April 29. These notes consist of $10,000,000 one-year 4½ per cent. notes and a $5,000,000 short term issue. A short term private loan has been arranged to pay these amounts and permanent financing will be deferred until after the proposed new bond issue for subway construction, elevated extensions and other purposes, mentioned in the *Railway Age Gazette* of December 23, 1910.

Louisville & Nashville.—See an item about the possible sale of securities in Railway Construction News.

Michigan Central.—See Canada Southern.

Missouri, Kansas & Texas.—This company has sold to Speyer & Company, New York, $1,000,000 5 per cent. two-year notes. These notes are part of the authorized issue of $16,000,000 of May 1, 1911-1913. All except $650,000 are now outstanding.

New York Central & Hudson River.—This company has sold to J. P. Morgan & Co., New York, $15,000,000 4½ per cent. coupon notes of May 1, 1912-1915. It is understood that the price was par and that a large amount of the notes were placed in London and Paris. These notes are part of an issue of $30,000,000 recently authorized by the New York Public Service Commission mainly to provide for the acquisition of stock of the New York & Harlem, the Rome, Watertown & Ogdensburg and the Utica & Black River.

See also an item in Court News.

New York, New Haven & Hartford.—See an item in general news.

New York State Railways.—The stockholders of this electric railway company, a subsidiary of the New York Central & Hudson River, will vote on May 14 on the proposal of the directors to cancel the company's existing mortgage, authorizing the issuance of $30,000,000 5 per cent. bonds, and to create in its place a mortgage authorizing a total issue of $50,000,000 bonds bearing not more than 4½ per cent. interest. Of the bonds to be retired only $4,500,000 have been issued, and they are in the hands of trustees. The company intends to apply to the New York Public Service Commission for approval of an issue of the new bonds somewhat in excess of the amount necessary to refund the $4,500,000 bonds to pay for the stock of the Syracuse Rapid Transit Company.

Pere Marquette.—This company has sold $605,000 4½ per cent. receiver's certificates to the Peoples State Bank, the First National Bank and the Union Trust Company, all of Detroit, Mich.

The receivers have been granted permission to pay the interest on underlying securities that fell due May 1. The Consolidated Bondholders' Committee neither approved nor opposed this court order.

Rutland.—See an item in Court News.

St. Louis, Iron Mountain & Southern.—Stockholders will vote July 9 on the question of authorizing a mortgage to secure an issue to $200,000,000 refunding bonds to be used for refunding, extensions, additions, betterments and equipment, and for the construction or acquisition of additional railways or property.

St. Louis & San Francisco.—This company has sold about 15,000,000 francs ($3,000,000) general lien 15-20 year 5 per cent. bonds, French series, to Speyer & Co., New York, who have resold them to Paris bankers. The proceeds are to be used for improvements and to take up equipment notes. The amount outstanding is now $64,944,000.

St. Louis Southwestern.—The entire outstanding amount of series B equipment 5 per cent. notes, dated January 20, 1911, have been called for payment at par and interest June 26 at the Bankers Trust Company, New York. On February 24, $1,584,000 of these notes were outstanding.

Union Pacific.—See an item in regard to land sales made by this company in General News.

Wabash.—This company has sold to Kuhn, Loeb & Company, New York, the $1,500,000 additional 5 per cent. receiver's certificates, mentioned in the *Railway Age Gazette* of April 26. These certificates rank on an equal basis with the original $10,000,000 issue, and mature on the same date as that issue, namely, August 1, 1913.

Winnipeg, Salina & Gulf.—See an item in regard to this company in railway construction news.